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The Journal of Obstetrics and Gynæcology of the British Empire

VOL. XXV. JANUARY, 1914. No. 1.

Rhabdomyosarcoma of the Uterus.

By

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RHABDOMYOSARCOMA appears to be a very rare neoplasm in the uterus or else it has been overlooked in this country, for, apart from a brief report of one of our own, we are unable to find any previously recorded case in Great Britain.

Cases have been described by German writers; one by Colomiatti[4] in Italy, and one in America by Robertson[20], who gave a table of 14 cases collected from the literature. Three of them, however, were not certainly rhabdomyosarcomata. We have collected 15 undoubted cases and 3 probable ones, and have added 2 recent cases of our own. One of the latter has already been briefly recorded by one of us (W. B. B.[2]). Our two new cases will first be described.

CASE I.

Clinical history. Mrs. McN., æt. 62, 2-para. The patient had always enjoyed good health except for frequent attacks of asthma. The menopause had occurred 10 years before. Since January 1911, that was for about 4 months, she had complained of a bloody vaginal discharge, which at times was profuse. After the discharge had continued for 3 months she passed *per vaginam* a mass of tissue of the same size and shape as an orange, and it was thought to be a disorganized fibromyoma. The vaginal discharge then diminished temporarily, but subsequently became profuse again; this led her to consult Dr. T. B. Grimsdale.

Clinical examination. The general condition of the patient was found to be fairly good. There was neither marked anæmia nor loss of flesh. The uterus was found to be much enlarged.

Operative procedures (by Dr. Grimsdale). (1) On April 10 1911. The cervix was dilated and some growth removed from the uterine cavity; (2) on April 26 1911 the uterus and appendages were removed by the abdominal route.

Progress of the case. The patient recovered from the operations; but 6 months later developed bronchitis with increasing dulness over the right side of the chest. She died in a few days from the lesions in the lungs. Dr. J. R. Logan, her physician, had made a diagnosis of pulmonary metastases. No post-mortem examination was made.

Pathological Description of the Specimen.

Macroscopical. The uterus was enlarged to the same size as that found at the 12th week of pregnancy. The tumour arose from the posterior wall of the corpus uteri and did not invade the cervix (Fig. 1). There was a small growth in the right ovary about the size of a bean.

Microscopical. The specimen had been fixed in alcohol. In the first instance portions of the growth—(*a*) removed at the first operation, and (*b*) removed at the second operation—were sent to the Clinical Research Society, which reported on the two specimens respectively as follows:—

(*a*) "There is no doubt that this is a malignant growth . . . and the most reasonable diagnosis is a spheroidal-celled carcinoma. We think, however, it may be of endothelial origin."

(*b*) "This uterine growth has the structure of a sarcoma composed largely of spindle-cells, but enclosing some swollen, very long cells with clearly defined nuclei whose nature is doubtful. Some of them we believe to represent muscle cells in process of absorption or possibly in a transition state to form cells of the growth. It is all complicated by a small-celled tissue reaction. It is a puzzling growth, and, although its main characters are sarcomatous, it is not impossible that it had an endothelial origin. There is also a growth in one ovary which microscopically is a columnar-celled carcinoma, and therefore apparently unconnected with the uterine tumour."

One of us (E. E. G.) subsequently examined the sections and recognized that the growth was a rhabdomyosarcoma.

Sections from two portions only were available. The first was from the tissue removed at the first operation, and the second from the growth removed with the uterus at the second operation. The sections were stained by van Gieson's method, and with hæmatoxylin and eosin.

The appearance of the growth was most striking; it consisted chiefly of large irregularly oval or round cells with rounded nuclei embedded in an extensive stroma of short spindle cells (Fig. 2). The irregularly round and oval cells were found to be muscle cells cut transversely. Their average diameter was about 30μ, though some were only 15μ. These cells for the most part were isolated from one another by the cells of the stroma, but some lay adjacent to each other in small groups. The nuclei measured about 13μ; they were usually vesicular with scanty and diffuse chromatin; in some the

Fig. 1. Case 1. Uterus and tumour.

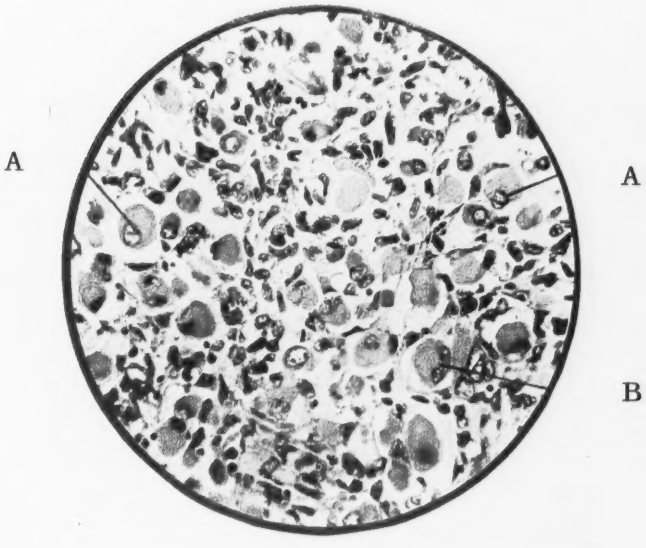

Fig. 2. Case 1. Tumour showing embryonic muscle fibres cut transversely—lying in a stroma of short spindle cells. Note: Fibrillation of cytoplasm, also cells with excentric nuclei (A). ×200.

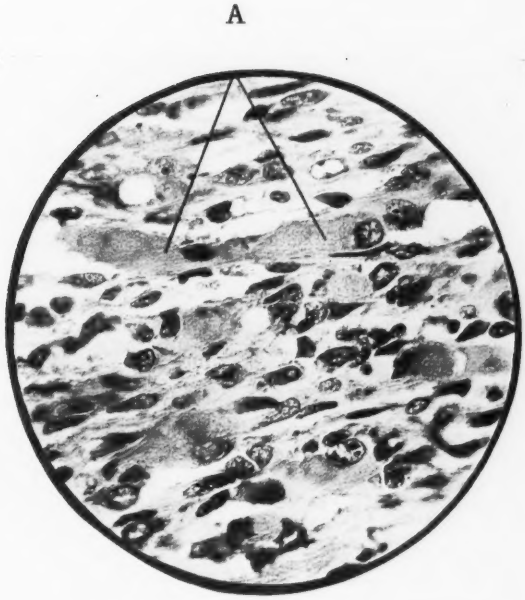

Fig. 3. Case 1. Tumour showing large, broad, embryonic muscle fibre with two nuclei (A), and a mass of sarcomatous tissue. ×350.

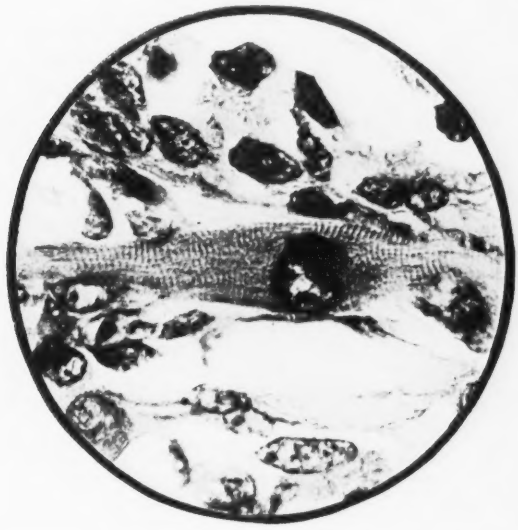

Fig. 4. Case 1. Tumour showing embryonic striped muscle fibre with transverse striations. ×850.

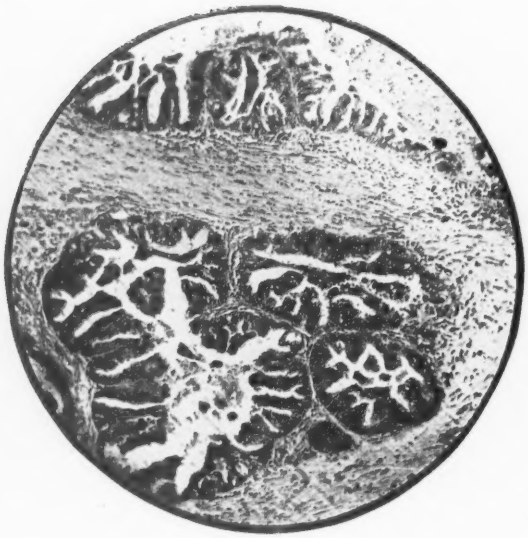

Fig. 5. Case 1. Adenocarcinomatous growth in right ovary. ×100.

Fig. 6. Case 2. Uterus with growth in the interior, and the expelled polyp below.

nucleolus was visible. The nuclei were usually not in the centre of the cell but excentric, (Fig. 2 A). Sometimes they were even situated on the periphery of the cells, in which case they were smaller and more oval and the chromatin was condensed. The position, shape, and appearance of these peripheral nuclei approximated to that found in normal striped muscle cells. The nuclei were usually single, but occasionally two or even three were present in one cell (Fig. 2 B).

A few of the muscle fibres were cut longitudinally and appeared as oblong protoplasmic bands with extremities either blunt or tapering. The maximum length of these fibres was 125μ, and the maximum diameter 23μ (Fig. 3). Some were multinucleated.

The cell cytoplasm stained like muscle with van Gieson's method. It was faintly fibrillated in the cells cut transversely (Fig. 2), while those cut longitudinally showed longitudinal fibrillation, and a few true transverse striations (Fig. 4). Occasionally small vacuoles were present.

The stroma in a general way resembled that of a sarcoma of oat-shaped or short spindle cells. The cell cytoplasm was scanty and indistinct, and the nuclei were irregularly oval and rich in chromatin. The average length of the nuclei was 7μ. Many of them were, however, only 5μ in diameter, and probably these represented not the nuclei of the round sarcoma cells but the nuclei of the oval sarcoma cells cut transversely. Here and there true fibrous tissue cells with long spindle-shaped nuclei were seen scattered about, and probably derived from the spindle-celled fibrous tissue of the host, which had persisted.

Blood-vessels were scarce, and their walls were fairly well developed. There was a certain amount of round-celled infiltration of inflammatory origin, especially in the piece removed at the first operation. Large multinucleated cells, myxomatous tissue, cartilage and uterine gland tissue so frequently found in these tumours were absent. The small growth in the ovary was a columnar-celled carcinoma (Fig. 5).

Case II.

Clinical history. Miss C., æt. 75 (approx.), 0-para. This patient was a spinster between 70 and 80 years of age. It was impossible to get the exact date of her birth. The menopause, she said, had occurred more than 20 years previously. The patient had had a slight blood-stained discharge since July 1911. On September 15 of the same year a large piece of growth was expelled *per vaginam* with profuse hæmorrhage. The patient's medical attendant (Dr. S. Wilkinson) sent this to one of us (W. B. B.), who on histological examination found that it was a mixed-celled sarcoma with striped muscle fibres, and advised operation.

General condition. The patient was fairly well nourished, but was slightly anæmic.

Examination per abdomen. There was resonance in the flanks. A central indefinite swelling could be felt over the symphysis pubis.

Examination per vaginam. A purulent discharge, which was blood-stained, could be seen issuing from the cervix. On bimanual examination the uterus was found to be greatly enlarged, to bulge forwards and to be rather fixed on the right side.

Operative procedures (by W. Blair Bell). (1) On October 2 1912. Complete abdominal hysterectomy, with vaginal clamps, and salpingo-oöphorectomy were carried out. The right tube and ovary were buried in adhesions and attached to the small intestine. This ovary was calcareous, and as there was no evidence of growth in the neighbourhood the bowel was not resected. (2) On December 28 enterostomy was performed under local anæsthesia for intestinal obstruction produced by the abdominal recurrences. This operation was very difficult as the abdomen was full of growth which had to be cut through before the bowel could be reached.

Progress of the case. The patient made a smooth and rapid recovery after the first operation and returned home; but a few weeks later it was evident that there was recurrence in the vagina and in the abdomen. The latter eventually produced intestinal obstruction, as already mentioned. The patient died from exhaustion ten days after the second operation.

Pathological Description of the Specimen.

Macroscopical. The uterus was opened sagittally after being fixed. The whole wall was stretched round a large polypoid growth in the interior. This growth was attached by a pedicle to the posterior wall of the uterus, and completely filled the dilated cavity. In the muscle wall of the uterus there were several small fibromyomata. The portion of growth which had been previously expelled was considerably larger than that remaining in the uterus (Fig. 6).

Microscopical. Sections were made from the portion of growth which was expelled, from the growth after removal of the uterus, and from the recurrences in the abdomen and vagina. The sections were stained by van Gieson's method, and with hæmatoxylin and eosin. The growth expelled from the uterus and the recurrences were fixed and hardened in a mixture of formol 100 cc., spirit 300 cc., acetic acid 10 cc., and water 1,000 cc. The uterus was fixed and hardened by Kaiserling's method. Sections through the mass expelled showed that the tumour was for the most part a very atypical mixed-celled sarcoma (Fig. 7). It was mainly composed of small round cells about 10μ and short spindle cells about 20μ in length, with scanty cytoplasm and relatively large vesicular nuclei.

Two other types of cell formed most conspicuous features,

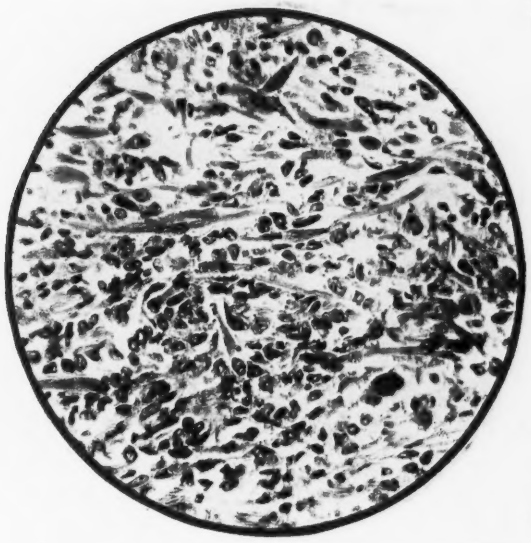

Fig. 7. Case 2. Expelled polp showing large spindle cells—some with longitudinal fibrillation—and small round and small spindle cells. ×200.

Fig. 8. Case 2. Expelled polyp showing a group of multinucleated cells (sarcoblasts), and small round and small spindle cells. ×200.

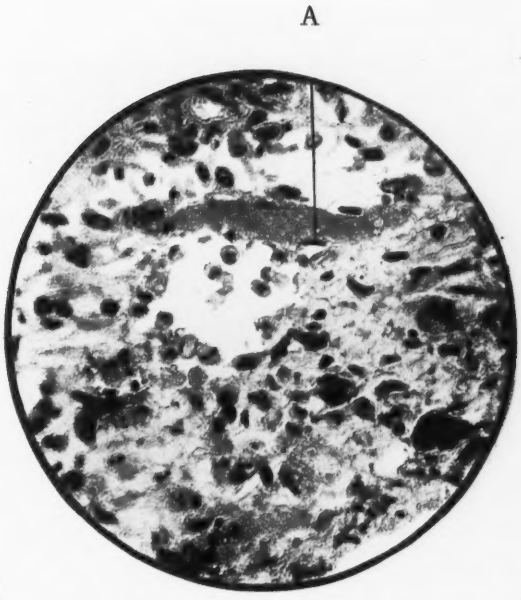

Fig. 9. Case 2. Expelled polyp showing large broad, embryonic muscle fibre. Note: Flattened nucleus on edge of fibre (A). ×350.

Fig. 10. Case 2. Expelled polyp showing embryonic striped muscle fibre with transverse striation. ×850.

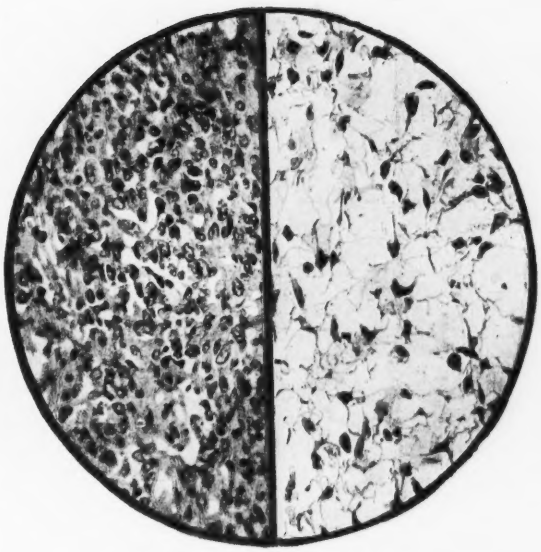

Fig.. 11. Fig. 12.

Fig. 11. Case 2. Growth removed with uterus showing an ordinary small round and small spindle celled sarcoma. ×200.

Fig. 12. Case 2. Vaginal recurrence showing myxomatous tissue. ×200.

namely, long tapering spindle cells and large multinucleated cells. The long spindle cells were fairly numerous and often occurred in small groups. They measured about 100μ × 12μ. Occasionally they were very large, more oblong and less tapered at the extremities, measuring up to 150μ long and 25μ broad (Figs. 7 and 9). The cytoplasm was longitudinally fibrillated in all these cells and in some of the larger cells there was true transverse striation (Fig. 10). The multinucleated giant cells were fairly numerous (Fig. 8). Their average size was about 40μ with a maximum of 80μ. The nuclei occupied the greater portion of the cell. They were very irregular, atypical and in some pluripolar mitosis had evidently occurred; hyperchromatosis and pyknosis were frequent. The large spindle cells and the multinucleated cells stained like muscle with van Gieson's method.

In places the tumour cells were loosely packed, apparently owing to œdema; and in some portions of the growth the cells were branched and there was a fibrillated ground substance characteristic of myxoma. Blood-vessels with thin walls were numerous, and the stroma was infiltrated with blood. A few large, isolated, dilated, regular gland acini lined by a single layer of rather atypical epithelium were scattered here and there.

Sections through the growth removed with the uterus had the usual appearance of a sarcoma of short spindle and round cells, the nuclei being exceedingly prominent and the cytoplasm relatively scanty (Fig. 11). Very few multinucleated and large spindle cells were present, and no transversely striated muscle fibres were found. Sections through the vaginal recurrence removed post mortem consisted almost entirely of pure myxosarcoma, and scarcely a single large spindle cell was found (Fig. 12). The recurrence from the abdomen was a mixed-celled sarcoma with many large multinucleated cells, but no striated muscle.

The general appearance of the growth removed from the uterus and the recurrences were so like that of an ordinary pure sarcoma that the true nature of the tumour would almost certainly have been overlooked had an examination not been made in the first instance of the polypoid mass which had been expelled. It is important to note that no cartilage was found in any of the sections.

Other Cases of Rhabdomyosarcoma.

In the following table 17 cases of undoubted rhabdomyosarcoma of the uterus have been collected together, and the principal details in connexion with them recorded. We have been unable to find any other cases in the literature.

In Table II three cases, in each of which the tumour of the uterus was probably rhabdomyosarcomatous in nature, but in which the description was incomplete or inconclusive, are placed together.

CASES OF UNDOUBTED RHABDOMYO-

Reported by	Age	Pregnancies	Site, Character and Progress of Primary Tumour. Treatment	Recurrences or Metastases
1. Weber, 1867. (24)	45	9	Small, soft, reddish polyp on anterior cervical lip. Recurred several times after operation, Finally invaded body of uterus.	Local recurrence.
2. Anderson-Edmansson, 1870. (1)	50	0	Arose from corpus uteri. Tumour large, soft, and nodular. Hysterectomy.	?
3. Kunert, 1874. (10)	35	0	Soft, red polypi on cervix. Amputation of cervix. Later nodules appeared in pelvic connective tissue, and these were removed.	Vaginal wall, pelvis and pleura.
4. Bystroumoff & Eckert, 1874. (3)	?	?	Small pedunculated tumour projecting from uterine wall.	None.
5. Colomiatti, 1882. (4)	50	?	Tumour probably arose from corpus uteri. Size of full term fœtus.	Three local recurrences. Probably secondary growths in lungs.
6. Müller, 1887. (12)	24	0	In cervix, size of hen's egg. Excision of cervix.	Left broad ligament and vagina.
7. Pernice, 1888. (17)	17	0	Arose from cervix uteri; amputation. Later invaded the body of uterus.	Abdominal.
8. Richter, 1892. (19)	$2\frac{1}{4}$		Arose from cervix uteri. Two operations for recurrences.	Local recurrence.
9. Pick, 1894. (18)	$2\frac{1}{2}$		Soft. polypoid growth from posterior wall of cervix. Growth rapid.	Extension into uterus.
10. von Franqué, 1899. (5)	49	11	Large, soft growth. Size of man's head. Arose from posterior uterine wall. Operation.	None.
11. Peham, 1903. (15)	18	0	Polypoid mass from cervix. Size of two fists.	On pelvic peritoneum.
12. Läwen, 1906. (11)	60		Arose from posterior uterine wall. Hysterectomy.	Abdominal.
13. Spuler, 1906. (22)	?	?	Cervical polyp. Hysterectomy.	?
14. Hunziker, 1907. (8)	58	2	Arose from anterior uterine wall. Surface nodular.	Pelvic, involving rectum and bladder.
15. Robertson, 1908. (20)	69	2	Probably primary in uterus. Pinkish, soft, lobulated and vascular. No operation.	None.
16. Bell, W. Blair, 1912. (2)	75	0	Arose from corpus uteri. Polypoid mass passed per vaginam. Hysterectomy.	Abdominal and vaginal.
17. Grimsdale, T. B., and Glynn, E. E. (Unpublished), 1912.	62	2	Arose from corpus uteri. Polypoid growth passed per vaginam. Hysterectomy.	Lung (Clinical evidence only).

SARCOMA OF THE UTERUS.—Table I.

Termination	Microscopical Findings
Perforation of uterus. General peritonitis. Death 9 months after operation.	Long spindle cells. Smooth muscle. Striated muscle cells resembling embryonic striated muscle.
Death from hæmorrhage.	Small mononucleated and large multinucleated cells. Cystic glands. Typical striated muscle.
Death from thrombosis of iliac vein 6 weeks after operation.	Large, round cells. Striated muscle.
?	Small spindle cells. Large multinucleated cells. Striated muscle.
Death from 'pleurisy.'	Large round cells. Striated muscle.
Death from purulent peritonitis 1 year after operation.	Primary growth was a round and spindle celled sarcoma with broad bands of striped spindle cells. Metastases: myxosarcoma with cartilage. No striped spindle cells.
Death from pneumonia 1½ years after operation.	Soft œdematous and myxomatous connective tissue. Young striated muscle. Hyaline cartilage. Glandular elements. No striped muscle in metastases.
Death after 2 years.	Round cells. Myxomatous tissue. Striated spindle cells.
Death from cachexia 6 months after first symptom.	Large round cells. Striated muscle.
Death 1 week after operation.	Sarcoma of spindle cells. Striated muscle. Cystic glands.
Cachexia.	Sarcoma with embryonic striped muscle. Cartilage and true myxomatous tissue.
Peforation of uterus. General peritonitis. Death 2½ years after first symptom, and about 1 year after operation.	Sarcoma of spindle cells. Smooth and striated muscle. Large multinucleated cells. Proliferating glandular elements.
?	Sarcoma of round and spindle cells. Many well-developed striped muscle cells. Some elastic tissue, and fat.
Death from cachexia 6 months after first symptom.	Sarcoma of round and spindle cells. Myxomatous tissue. Cartilage. Smooth and striated muscle. Glandular elements.
Death 8 months after first symptom from renal calculus and pyelonephritis.	Sarcoma of spindle cells. Large multinucleated cells. Striated muscle. Myxomatous tissue.
Death 6 months after first symptom and 3 after operation. Recurrence in vagina and abdomen.	Sarcoma of small round and small spindle cells. Very many giant cells, some embryonic muscle cells, a few being striated. Myxomatous tissue. A few glandular elements. Recurrence closely resembled pure myxosarcoma.
Death from pulmonary lesions 10 months after first symptom and 6 after operation.	Sarcoma of small round and small spindle cells. Very many embryonic muscle cells, a few being striated.

CASES OF PROBABLE RHABDOMYOSARCOMA OF THE UTERUS.

Table II.

Reported by	Age	Preg-nancies	Site, Character and Progress of Primary Tumour. Treatment	Recurrences or Metastases	Termination	Microscopical Findings
Volger, M. (23) 1898.	66	3	A pedunculated tumour of the corpus uteri. Size of a child's head,	Infiltration of bladder and intestine.	?	Sarcoma of round spindle and giant cells. Myxomatous tissue. Smooth muscle, and some fibres similar to young striped muscle, but no striation seen.
Penkert, 1905. (16)	62	12	Arose from the anterior uterine wall. Pedunculated.	?	?	Sarcoma of spindle cells. Myxomatous tissue. Cartilage. Giant cells. Uterine cells (a) with cystic dilatation, (b) with adenomatous, and (c) with commencing adenocarcinomatous degeneration. Smooth muscle, some of which closely resembled cross striped embryonic muscle, but the cross striations could not be demonstrated with certainty. There was also present carcinomatous tissue and endotheliomatous-like tissue. The carcinomatous cells, as distinct from the adenocarcinomatous cells, were polymorphic with irregular round or oval nuclei and were embedded in a stroma partly sarcomatous.
Kehrer, 1906. (9)	38	5	Lobulated tumour from right wall of cervix. Hysterectomy.	None.	Intestinal obstruction from adhesions between stump of adnexa and intestine.	Sarcoma of round and spindle cells. Cartilage. A little bone. Myxomatous tissue. Smooth muscle. Some large cells which resembled striped muscle cells in a rhabdomyoma of the kidney described by the author. On examining these large cells with an oil immersion lens longitudinal striation was obviously present, but transverse striation could not be demonstrated with certainty.

Tables I and II are modelled on a similar plan to that of Robertson [20], but certain corrections and additions have been made. Robertson's table contained 14 cases of supposed rhabdomyosarcoma. We have omitted three of these from our Table I, namely, those of Penkert,[16] Kehrer, [9] and Gebhard.[6] The first two have been transferred to our second table because striated muscle was not definitely present. Gebhard's case has been omitted altogether, for the tumour was a very mixed one and contained fat, cartilage, uterine gland tissue, endothelial cells (some being arranged in "cell nests similar to those found in epithelioma"), spindle-celled sarcomatous tissue and smooth muscle cells; but Gebhard expressly states that striped muscle was *absent*.

We have added five cases to Robertson's table, namely, those of Müller,[12] Peham,[15] Spuler,[22] Blair Bell,[2] and Grimsdale and Glynn. With regard to Penkert's case, it is highly probable that the "polymorphic carcinomatous cells with the irregular nuclei embedded in a stroma partly sarcomatous" were really large muscle cells cut transversely, as in our Case 1.

Häger [7] has described a pedunculated malignant tumour of the uterus in a woman of 44, which contained spindle cells and some multinucleated cells; Volger [23] regards this as possibly a rhabdomyosarcoma.

Orth [14] also, in his text-book, gives a microscopic picture of a polypoid sarcoma of the uterus containing some striped muscle fibres, but the pathological description is very imperfect and all clinical details are absent.

All the cases in the Tables I and II have been verified except that of Richter [19] and that of Anderson-Edmansson [1] which we cannot find in Referat-Virch. Hirsch. Jahresbericht 1, for 1869 or 1870.

General Pathological Description of Uterine Rhabdomyosarcomata.

It is clear from what has been said that the structure of uterine rhabdomyosarcoma is very complex. In the first place, the transversely striated muscle cells are very few and form only a small portion of the tumour. The term *rhabdomyo*sarcoma is used for the same reason as the term 'myeloid' sarcoma, simply to indicate the presence of a very characteristic type of cell.

In addition to muscle cells in various stages of development there are also present small spindle and small round cells, which sometimes, as in our Case 1, form a stroma for the larger muscle cells. Other elements frequently found are:—

1. Multinucleated cells or sarcoblasts. Noted in five cases, namely, 2, 4, 12, 15 and 16.

2. Myxomatous tissue. Noted in seven cases, namely, 6, 7, 8, 11, 14, 15 and 16.

3. Cartilage. Noted in five cases, namely, 4, 6, 7, 11 and 14.

4. Gland tissue. Noted in six cases, namely, 2, 7, 10, 12, 14 and 16.

These neoplasms come under the category of mesodermal mixed tumours and probably arise from displacements of embryonic mesodermal tissue from the lumbar region during early fœtal life.

In this connexion it is of some interest that Nehrkorn[13] described a rhabdomyomatous (not rhabdomyosarcomatous condition) of the posterior wall of an otherwise normal uterus; and Shattock[21] has recently published three cases of rhabdomyoma of the urinary bladder.

The persistence of the actual embryonic round-celled tissue may give rise to some of the small round cells so frequently present. Wilms, according to Kehrer, believes that all the heterologous tissue found in rhabdomyosarcomata develop from these primitive embryonic round cells.

The glandular elements occurring in some of the cases are, according to Läwen,[11] possibly derived from the Müllerian ducts. It seems much more probable to us, however, that they are persisting uterine glands, and they may under certain circumstances undergo collateral hyperplasia, or even as Kehrer states, carinomatous degeneration.

A histological comparison of the growths in our two cases shows that Case II is undoubtedly the more malignant. This is in accord with the clinical history, for the patient lived only 6 months after the first symptoms, whereas the other patient lived 10 months. It is interesting to note that striped muscle was absent not only in the metastases of our Case II, but also in Cases VI and VII (Table I).

The small columnar celled carcinoma in the right ovary in Case I had most probably no connexion with the uterine tumour, though in the absence of a post-mortem examination we are unable to be certain.

General Clinical Description.

Etiology. Rhabdomyosarcoma of the uterus may occur at any age, the limits recorded being $2\frac{1}{4}$ years of age and 75 (approx.) years. Of the 14 patients over 20 years of age, 8 had had children—46 children between them. Four above this age had had no children, but probably some of these, as in our Case II, had not been married. It is impossible, therefore, to ascribe to childbearing or the opposite any influence in regard to the appearance of the disease.

Symptoms. Hæmorrhage and a foul discharge are the chief symptoms of this, as of any other malignant disease of the uterus. The hæmorrhage may be profuse for two reasons: firstly, the growth is very friable and rapidly breaks down; and secondly, it is practically always polypoid in character. When, therefore, the growth

projects into the body of the uterus, as is recorded in many of the cases, hæmorrhage is liable to be severe. When it projects into the vagina and arises from the cervix, the growth becomes septic, ulcerates superficially and gives rise to a foul discharge, and in some cases to serious bleeding. It is interesting to note that in both our cases large portions of growth were expelled *per vaginam*. In Fig. 6 the expelled portion is shown below the picture of the uterus with the remaining portion of the growth contained in the uterine cavity. The uterus had evidently contracted down on this retained portion. There may be marked anæmia, cachexia and debility when the disease is advanced.

Physical signs. If the growth be in the body of the uterus the signs are simply those of tumour formation in that organ. The uterus is enlarged, usually regular in shape, owing to the fact that the growth is generally polypoid and projects into the uterine cavity. If the growth arises from or be extruded through the cervical canal, a friable, breaking-down septic growth is found projecting into the upper part of the vagina.

Diagnosis. Clinically the disease must be distinguished from breaking-down fibromyoma from carcinoma and pure sarcoma, but correct diagnosis is only possible after histological examination. The fact that, as far as we are aware, no cases of rhabdomyosarcoma of the uterus have been reported in this country may be due to errors in microscopical diagnosis, the growths being described as mixed-celled or spindle-celled sarcoma, and their true nature overlooked.

The microscopical diagnosis is not easy: firstly, because the number of transversely striated muscle cells is so small, especially in the more atypical tumours—indeed, they may be completely absent in the metastases; and, secondly, because the transverse striation, even if present, is difficult to demonstrate.

The following appearances suggest that transversely striated fibres will be found if looked for:—

1. The sarcoma is of a *mixed-celled* variety, especially if multinucleated cells are present.

2. The sarcoma contains very large spindle cells or oblong protoplasmic bands, especially if the nuclei are excentric.*

3. The staining reaction with van Gieson of the large spindle cells or multinucleated cells is characteristic of muscle.

The transversely striated fibres are best seen with an oil immersion particularly an apochromatic using at the same time a partly-closed diaphragm. They may also be demonstrated with polarized light.

* Of course if the large spindle cells are cut transversely they will appear as large round cells as in our Case 1.

Prognosis. The prognosis is exceedingly grave. Rhabdomyosarcoma of the uterus appears to rival chorion-epithelioma in its malignancy, rapid growth and in the speed with which it leads to a fatal issue.

In the recorded cases there appear to have been 14 deaths within a few months of the first symptoms. The longest period of time any of these cases survived was one year after operation and $2\frac{1}{2}$ years after the first symptoms. A few of these deaths, however, appear to have occurred as the result of operative procedures.

In four of the patients the termination is not described; while in the remaining two death occurred in one case from 'pneumonia' $1\frac{1}{2}$ years after operation, and in another from intestinal obstruction following operation. There may have been metastases in the lungs in the first of these two cases, and local recurrence in the abdomen with intestinal obstruction in the other, as occurred in the second of our cases.

We are very much indebted to Dr. Grimsdale for his kind permission to publish Case 1.

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Syphilis in Relation to Uterine Disease.*

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Introduction.

The occurrence in the uterus of lesions the result of syphilitic infection has long been regarded as extremely rare. Apart from the occasional observation of a primary chancre upon the portio vaginalis of the cervix uteri, or the suggestion that some slow-spreading and non-malignant ulceration in the same area may be of syphilitic origin, very little has been written upon the subject. It is significant that the few existing records have always been concerned with the cervix. If it is true, therefore, that the corpus does possess a definite immunity to the spirochæta pallida, it is surely a matter of considerable interest, especially as the relationship is so intimate in connection with placental and fœtal syphilis. The fact requires confirmation, and with the advent of more exact methods of investigation and diagnosis, it appears advisable that the position as regards the relationship of syphilis to the uterus should be reconsidered.

Such investigation must proceed along one or both of two lines of enquiry, viz.: (1) the application of the Wassermann reaction to patients who present uterine lesions, the pathology of which is at present somewhat obscure; (2) attempts to demonstrate the spirochæta pallida in the tissues or secretions of the uterus.

For some months I have been carrying out an investigation on these lines at the General Hospital, Birmingham; and it is on the results so far obtained that the present communication is based. At the same time, I wish it to be understood that the paper is rather of the nature of a preliminary report, in order to invite suggestions, rather than to submit a completed series of observations, since such work must inevitably occupy many months before a long and conclusive series of figures can be brought forward.

Fibrosis of the Uterus.

In a paper upon the causation of uterine hæmorrhage, published in 1912,[1] I suggested that the underlying pathological factor in some cases of chronic metritis and fibrosis uteri might be syphilis, and advised that the Wassermann test be applied to such patients.

In August 1913, Miss McIlroy[2] published the results of an investigation in Glasgow of 100 successive out-patients by the Wassermann reaction, and found that nearly 50 per cent. were

* Read at the Obstetrical and Gynæcological Section, Royal Society of Medicine, December 1913.

positive. In the same paper she also observed that syphilis might have some relation to fibrosis uteri.

Since writing the communication to which I have referred, 18 cases with a clinical diagnosis of "chronic metritis" have come directly under my notice, and the blood of each of these patients has been tested by the Wassermann reaction at the Lister Institute of Preventive Medicine.

It is interesting to note that only one of the patients furnished a history of syphilitic infection, and until the report of the Wassermann test was received there was no reason to suspect any syphilitic lesion. In fact, all the patients but one denied most strongly ever having contracted the disease or of having exhibited symptoms suggestive of the same. Nevertheless seven of the cases gave a well-marked positive reaction.

These patients all applied for treatment on account of pelvic pain, irregular and profuse uterine hæmorrhage and watery or mucopurulent discharge. The physical signs obtained on bimanual examination were those usually regarded as characteristic of chronic metritis, or fibrosis uteri, viz., a uterus slightly and uniformly enlarged, firm in consistence and tender upon palpation. The uterine adnexa were healthy. In three cases the hæmorrhage was so profuse in spite of previous curetting and intrauterine application of iodine, nitric acid, etc., that it was necessary to remove the organ. In two of these cases a Wassermann test was made and found positive after the hysterectomy was performed, and when the morbid anatomy of the specimen had been observed. In the third and last case the patient presented similar symptoms to the two preceding, and a positive reaction was obtained before operation. A point of some importance, therefore, is the fact that in all three cases, where symptoms were so severe as to call for a radical operation, a positive reaction was given.

The specimens which I bring before you all show different degrees of a lesion which has been recognized for a long time, viz., fibrosis. In the most marked case the uterus measures $4\frac{3}{4}$ in. in length and weighs 11 oz. The anterior wall measures $1\frac{1}{2}$ in. in thickness, and shows a marked increase of fibrous tissue, to the exclusion of the myomatous elements. The endometrium is not hypertrophic, but is very congested and hæmorrhagic. Microscopically, the tissue shows extreme fibrosis with well-marked peri- and end-arteritis. Sections stained by Pappenheim's method show no plasma cells. A full description of the pathological appearances present in the specimens of these three cases, together with a brief resumé of the important clinical facts in the histories of the seven patients giving positive reactions, is contained in the appendix to this paper.

In discussing these cases the question naturally arises as to

whether one is correct in attributing the lesion to syphilis, or whether it is merely a condition of different etiology occurring in a syphilitic subject. Various factors have been suggested in turn as possible causes in the production of the fibrotic uterus. It is hardly necessary to mention such causes as repeated pregnancy, previous inflammation, etc. It is, in fact, sometimes said that fibrosis never occurs except in the uteri of parous women, or in those of nulliparæ who have had previous uterine inflammation. As regards this statement, I have certainly seen one case in a nullipara where there was no evidence to show that previous inflammation had existed. This patient came under my notice several years ago, and I regret now that no Wassermann reaction was obtained, since at that time I never suspected syphilis as a possible cause of the lesion. Again, if inflammation is really the cause of most cases of chronic metritis, it is somewhat surprising that the infection does not spread more frequently to the appendages and peritoneum. I shall be interested to hear the experience of others as to the incidence of inflammation of the appendages in association with fibrotic conditions of the uterus. Personally, I have found the complication extremely rare. Also, in those cases that I have examined bacteriologically, about a dozen in all, the uterus has invariably been sterile, both by ærobic and anærobic methods. This, however, cannot be used as an argument against bacterial infection being the cause of the lesion, since the infecting agent may be long dead, as in the case of chronic pyosalpinx.

I have usually regarded fibrosis in the uterus as being a reparative process secondary to degeneration of the myomatous elements. This, especially in elderly women, is the result of arterio-sclerosis. However, in the light of the positive Wsasermann reaction obtained in the cases I have recorded, it appears that this fibrosis is also at times associated with a syphilitic element. As Andrews observes, there are[3] certain lesions of advanced syphilis which are intrinsically fibrotic from the beginning. Thus the pericellular hepatic cirrhosis and the indurative lung lesion known as "white hepatization" of syphilitic infants are both essentially a fibrosis. Again in the acquired disease, interstitial myocarditis, orchitis, and the sclerosing forms of osteitis, must all be placed in the same category, and all these bear a very close resemblance, both macroscopically and microscopically, to the disease which we describe as chronic metritis.

Again, the vascular changes in the uterus in this condition also bear a striking resemblance to those seen in the vessels of organs undoubtedly syphilitic. At the same time, it must be remembered that every obliterative endarteritis is not syphilitic. Tubercle, and in fact any chronic endarteritis, may tend to obstruct the blood channels, and in the case of the uterus such changes undoubtedly occur as the result of pregnancy. However, in the case of the

nullipara, to whom I have already referred, and where, unfortunately, no Wassermann reaction was performed, sections through the fibrosed uterus showed a well-marked obliterative endarteritis. It is highly probable, therefore, that those changes in the vessels of the uterus which we regard as more or less normal in the case of a parous woman, provide a source of error by obscuring and covering similar changes which are the result of the syphilitic virus.

It is a matter of considerable interest that a true gumma does not occur in the corpus uteri. At the same time, it must be remembered that both gummatous infiltration and fibrosis are essentially new formations of connective-tissue. In the former the cells tend to early necrosis, whilst in the latter, as Andrews says, "the reaction achieves its goal." It is possible that the periodical congestion of the uterus prevents that local tissue death which is the essential process in a gumma and permits the organization of the young connective-tissue cells to fully developed fibrous tissue.

The early lesions of syphilitic fibrosis of the uterus do not come under observation, because they do not give rise to symptoms calling for immediate treatment. The one symptom of the fibrotic uterus that calls for active measures is hæmorrhage. This is not produced until the contractile power of the organ is destroyed by the extreme replacement of the uterine muscle by fibrous tissue, and is therefore a late symptom.

The conclusive proof that uterine fibrosis is due in some cases to syphilis would be of course the demonstration within the tissues of the spirochæta pallida. So far I have been unable to show the organism in sections stained by Giemsa's method. At the same time, it must be remembered that it is only within the last few months that the organism has been found in the central nervous system in cases of tabes dorsalis and general paralysis of the insane. The relationship of both these diseases to syphilis has long been suspected, but the extreme difficulty in finding the specific organism has until recently obscured the pathology of the same. As Dr. Mott [4] says, the term "parasyphilis" as applied to these two conditions must now be abolished. It is more than probable, therefore, that those purely fibrotic lesions which occur in the testis, heart, uterus, and other organs, are also directly due to the spirochæta pallida, and must not be regarded as parasyphilitic in nature. The failure to demonstrate the organism in the tissues is possibly due to the small number present, and in future I propose to employ smear preparations made from an emulsion of the tissues.

Before leaving the subject of syphilitic fibrosis of the uterus, I may refer briefly to the value of the Wasermann reaction as a true test for syphilis in women. It must be remembered that of my 16 cases of chronic metritis, 7 gave positive reactions, and 9 negative. In other words, on this very small basis, the possible cases form

about 43·75 per cent. of the whole. According to Browning and Mackenzie,[5] it may be said that 85 per cent. of cases in which there are active syphilitic lesions, give a positive Wassermann reaction. A small proportion, on the other hand, fail to give a positive reaction in spite of the presence of undoubted syphilis. The authors to whom I have referred attribute this to the fact that the parasites are too restricted in their distribution to produce a positively reacting serum. Also the question of latent syphilis must not be overlooked. During a latent period 50 per cent. only of cases give a positive reaction. Furthermore, as shown by Knöppelmacher and Lehndorff,[6] 50 per cent. of the mothers of syphilitic children give a positive reaction some years after the birth of the last child, whereas a few months after parturition 90 per cent. of such women react positively. These women are therefore to be placed in the same category as latent syphilitics, and I am of opinion that it is largely from this class that the ranks of our chronic metritis patients are filled. This fact would certainly account for the percentage of positive reactions in the present series.

Finally, we must remember that clinically "chronic metritis" is at present somewhat a vague term, and possibly several pathological lesions are included under the one heading. This being so, the Wassermann test will be of value in picking out those cases possessing a syphilitic factor and differentiating them from others which clinically present a similar picture.

The exact relation, however, which syphilitic fibrosis of the uterus bears to fibrosis due to other causes must at present remain undetermined, until more figures are available from various sources.

Pyometra.

Another uterine lesion which also appears to bear a distinct relation in some cases to syphilis is pyometra. Distension of the uterine cavity with pus is most frequently regarded as a concomitant of malignant disease. Nevertheless, the last two cases that have come under my own observation have both occurred in patients exhibiting well-marked evidence of tertiary syphilis, and in whom there was no evidence macroscopically or microscopically of any carcinomatous change in the uterus. Dr. Thomas Wilson has also very kindly given me details of two more cases of pyometra occurring apart from malignant disease in patients who had a clear syphilitic history.

In the present paper it is not possible to consider in detail this interesting association. In a later communication I hope to deal at length with the subject, and in the meantime shall be grateful for any details relating to the co-existence of pyometra and other syphilitic lesions in the same patient.

Syphilis and the Menstrual Blood.

In conclusion, I wish to refer briefly to some observations recently

made upon menstrual blood collected during the secondary stage of syphilis through an intra-uterine catheter.

I was led to examine the material as a result of the researches of McDonagh and Ross upon syphilitic fluids and blood, which proved the existence within the white cell of an intracellular body. The relation of these intracellular inclusions to syphilis is unknown beyond the fact that they have been unobserved in man apart from the disease. It has been suggested that they are a stage in the development of the specific spirochæte. Since they have been demonstrated by several observers in the circulating blood during the secondary stage, I thought it of sufficient interest to examine the menstrual fluid in the first and second days by the "in vitro" method of staining. Altogether five patients have been examined, and in two of these, after a prolonged search occupying several hours, I recognized the copper-coloured intracellular bodies described by the above observers as present in the circulating blood. The presence of such bodies in the menstrual fluid is important as proving a possible source of infection to the uterine tissues through which they pass.

Furthermore, their existence in the menstrual blood during the secondary stage of the disease suggests that the spirochæta pallida itself may be present in the same fluid, although up to the present I have been unable to find the same in films stained by Giemsa's or Levaditi's method.

Conclusions.

The conclusions therefore that I think may fairly be drawn from the observations so far completed are the following:—

(1) The importance of recognizing a form of fibrosis of the uterus produced by the virus of syphilis; in other words, the existence of a true syphilitic fibrosis.

(2) The necessity of testing by the Wassermann reaction all patients who present the clinical picture of chronic metritis and fibrosis, since this may provide the only evidence of the syphilitic nature of the affection.

(3) The exact proportion which cases of syphilitic fibrosis bears to similar gross changes produced by other factors must at present remain undetermined, until a longer series of cases has been investigated.

(4) It is possible that so-called cases of non-malignant pyometra are also of syphilitic origin, and if no obvious signs of syphilis are present such patients should be tested by the Wassermann reaction.

(5) It is suggested that the menstrual blood be examined for the spirochæta pallida, especially during the secondary stage of syphilis, since the intracellular bodies described by Ross and McDonagh have been demonstrated.

In conclusion, my thanks are due to my senior colleague, Dr. Thos. Wilson, for very valuable help both as regards material and suggestions.

Abstract of Cases of Syphilitic Fibrosis of the Uterus.

Case 1. M.E., aged 33, a 2-para, admitted to the General Hospital, Birmingham, in July 1913, complaining of irregular uterine hæmorrhage and purulent vaginal discharge of eight years' duration. The patient had been married for nine years and had lived in Ceylon for the greater part of this period. Until eight years ago her health was good. Then, following a full-term labour, she began to have irregular and profuse uterine hæmorrhage accompanied by hypogastric pain. The patient again became pregnant one year later and went to term. No pregnancy occurred within the last six years before admission, and the hæmorrhage continued, becoming progressively more severe. Two curetting operations were performed without relief to the symptoms, the bleeding recurring shortly after the operation.

Bimanual examination of the pelvic organs showed that the uterus was uniformly enlarged to a small degree, very firm on palpation, somewhat tender on pressure, and freely movable. The appendages were normal. No obvious signs of syphilis were present. A moderate degree of anæmia existed, and in view of the failure of curettage to control the symptoms, Dr. Thomas Wilson removed the uterus and both appendages by abdominal hysterectomy. The patient made a good recovery.

Pathological Report on Specimen.

The specimen consists of the uterus and both appendages, the whole weighing 5 ozs. The uterus is uniformly enlarged and measures 4 in. × 3 in. × 2 in. The peritoneal surface is smooth and free from irregularity or adhesions. The fundus and posterior wall, however, are congested and dark red in colour. The anterior wall was sterilized by heat and the cavity of the organ then exposed. Cultures were taken from the endometrium upon blood serum and broth. These proved sterile. The uterine wall upon section measures 1 in. anteriorly and $1\frac{1}{8}$ in. posteriorly. The consistence of the wall is firm and the amount of fibrous tissue increased. The vessel walls are thickened and the cut vessels stand out in relief from the rest of the surface. They are best marked at the junction of the outer and middle thirds of the uterine wall. The endometrium is hypertrophic, irregular and slightly polypoid and congested. This appearance is limited to the corpus uteri. Below the level of the os internum the mucosa is smooth. The cervix is healthy. No neoplasms are present in the organ. The Fallopian tubes are normal in every way. No adhesions are present, and there is no evidence

of any inflammation. The left ovary presents a large and slightly cystic corpus luteum. The right requires no detailed description.

Sections of the uterus were placed in Flemming's solution and formalin, and subsequently stained by Sudan III. Pappenheim's method, and by van Geison and hæmatoxylin. The preparations show an absence of fatty change, but a considerable increase in the amount of interstitial fibrous tissue. This is especially well marked around the vessels which themselves exhibit a peri- and end-arteritis. No plasma cells are seen by Pappenheim's method of staining either in the endometrium or metrium. The pathological change is therefore essentially an interstitial fibrosis, especially marked around the vessels of the muscular wall. The patient's serum reacted positively to the Wassermann test.

Case II. S.A.G., aged 33, a 5-para, sent to me in September 1912, by Dr. McColl, of Tamworth, with a history of irregular uterine hæmorrhage and paroxysmal hypogastric pain. The patient had been married 13 years and gave a history of four premature labours out of a total of five pregnancies, at periods varying from six to eight months. At the same time, she very firmly denied ever having suffered from any symptoms or signs which could be attributed to syphilis. She dated her present condition from the last premature labour, four years ago.

On examination I found the uterus somewhat enlarged, firm, movable and tender on pressure. There was a severe laceration upon the left side of the cervix extending to the vaginal vault. At the time I contented myself with curetting and repairing the damaged cervix by Emmett's operation.

I did not see the patient again until June 1913, when she returned and told me that although there had been some temporary benefit from the operation, she was now as bad as ever and desired something more radical. In the absence of more marked physical signs, I did not care to remove the uterus, and therefore suggested application to the uterus of nitric acid and iodine. This was carried out at regular intervals, but without relief to the symptoms either of hæmorrhage or pain, and therefore in August 1913 I performed hysterectomy. The patient made a good recovery and now appears to be in good health.

Pathological Report on Specimen.

The specimen consists of the uterus and both appendages removed by abdominal hysterectomy, the whole weighing $5\frac{1}{4}$ ozs. The uterus is enlarged and firm in consistence. It measures 4 in. $\times 3\frac{1}{4}$ in. $\times 2$ in. The peritoneal surface is smooth and free from adhesions. On section the uterine wall is thickened and very dense. The walls of the blood-vessels in the metrium are much thickened and are readily visible at the junction of the outer and middle thirds of the cut

surface. The endometrium is atrophic and smooth, and no signs of hæmorrhage are present.

Cultures taken from the endometrium after sterilization of the uterine wall by heat, upon agar, blood serum and broth were sterile.

Both Fallopian tubes are normal and show no signs of inflammation either in the mucous membrane or upon the peritoneal covering. The ovaries are small, hard and fibrotic. Follicles are few in number and no lutein tissue is seen. Sections of the uterus stained by Van Geison, Pappenheim and Sudan III show a considerable increase of interstitial fibrous tissue, especially around the blood-vessels. The latter exhibit a well-marked peri- and end-arteritis. No fat or plasma cells are seen in the uterine wall. The endometrium is atrophic, but shows a few collections of small lymphocytes in the stroma. Sections of the uterus, stained by Giemsa's and Levaditi's method, do not show the presence of spirochætes. The serum of the patient reacted positively to the Wassermann test.

Case III. E.P., aged 49, an 8-para, admitted to the General Hospital, Birmingham, in September 1913, complaining of severe uterine hæmorrhage of four years' duration. The patient had been married 23 years, and gave a history of three abortions and five full-term pregnancies. She had always had good health until four years before admission and had never suffered from any symptoms suggestive of syphilitic infection. Four years ago a severe hæmorrhage occurred. This was attributed to a supposed abortion, and the uterus was curetted. For two years subsequently the periods were regular but very profuse and necessitated rest in bed. She then had another severe bleeding lasting seven weeks and the uterus was again curetted. Temporary relief was obtained, but for the last twelve months before admission the hæmorrhage recurred, lasting 4—8 weeks and producing a severe degree of secondary anæmia. Pain was not a marked symptom of the case.

On admission, a well-marked secondary anæmia was present, the red cells numbering 3,120,000, leucocytes 7,500, hæmoglobin 70 per cent., and colour index 1·5.

On bimanual examination of the pelvic viscera the uterus was found to be uniformly enlarged to about the size of the fœtal head. It was very firm in consistence, not markedly tender on palpation, and freely movable. The uterine appendages were normal.

No signs of any syphilitic lesions were found on the patient, but her serum gave a well-marked positive Wassermann reaction.

Dr. Thomas Wilson performed abdominal hysterectomy, and the patient made a good recovery, and is now apparently in good health.

Pathological Report on Specimen.

The specimen consists of the uterus and both appendages. The uterus is uniformly enlarged and measures $4\frac{3}{4}$ in. by 4 in. by $2\frac{1}{2}$ in.,

and weighs 11 oz. The organ is ovoid with no irregular prominences. It is smooth in the surface, and no adhesions are present. The Fallopian tubes enter the uterus on a level with the fundus. The consistence is firm and appears to indicate an increase of fibrous tissue. Cultures taken from the endometrium, after sterilization of surface of the organ by heat and incision through the anterior wall, were sterile upon agar, blood serum and broth. On section, the uterine wall is much increased in thickness, and measures $1\frac{1}{2}$ in. through the anterior wall and $1\frac{1}{8}$ in. through the fundus. The os internum is situated at a distance of 1 in. from the os externum. The uterine cavity from fundus to os externum measures $3\frac{1}{2}$ in. The uterine wall at the level of the os internum does not present the same hypertrophy and measures only $\frac{3}{4}$ in. in thickness. The hypertrophy of the corpus appears macroscopically to be due essentially to a diffuse overgrowth and increase in the amount of fibrous tissue. No neoplasms are present and the strands of fibrous tissue are firm on palpation and stand out in relief on cross section. The vessels at the junction of the outer and middle thirds of the uterus present very thickened walls and are raised above the cut surface. This change affects all parts of the corpus uteri, and to the naked eye very little muscular tissue remains.

The endometrium is extremely hæmorrhagic. It was dark red upon exposure but rapidly assumed a bright red tint when exposed to the air. The hæmorrhage involves all parts of the fundus and uterine cavity, but ceases abruptly at the level of the os internum. On examination with a lens the blood is seen to be (*a*) contained in a congeries of minute venous channels, and (*b*) diffuse in the substance of the endometrium. The ramifications of the capillaries are best seen near the level of the os internum. The endometrium is not markedly hypertrophic. It is slightly irregular on the surface, but the irregularities are due rather to hæmorrhages or localized engorgement of vessels rather than to overgrowth of the tissues. The cervical mucosa is healthy, although the tissues are somewhat soft and œdematous. The os externum, before section, easily admitted the tip of the index finger. The cervical glands are large and secrete a glairy mucinous fluid. No hæmorrhage is present in the cervical mucosa. Neither is there any interstitial bleeding apparent in the uterine wall.

Both Fallopian tubes are healthy. To the right is attached a pedunculated Kobelt's cyst. Both ovaries are cystic, the left organ containing a follicular cyst, $1\frac{1}{4}$ in. in diameter. The stroma of each ovary is œdematous.

Sections of the uterine wall, stained by van Geison's method, show a great increase in the amount of fibrous tissue to the exclusion of the myomatous elements. The fibrosis is especially well marked around the smaller blood-vessels. These show peri- and end-arteritis.

No plasma cells are seen in sections stained by Pappenheim's method. Fat is absent in preparations stained by Sudan III, and up to the present it has not been possible to demonstrate the spirochæta pallida in the tissues when stained by Levaditi's or Giemsa's method.

The endometrium shows engorgement of the capillaries and diffuse hæmorrhages into the stroma.

Case iv. E.H., aged 50, sent to me by Dr. Francis, of Stourbridge. The patient was a 3-para, and had never suffered from any symptoms suggestive of syphilitic infection. Her three pregnancies had all continued to full-term and the children, as far as could be ascertained, were healthy. She complained of severe irregular uterine bleeding of two months' duration, and the fact that although subjective symptoms of the menopause had been present for some months, she still continued to have profuse losses. Pain was severe over the sacral region, especially during the periods of uterine bleeding. On examination, the uterus was found to be in good position. It was somewhat enlarged, however, and on palpation was very hard in consistence. The cervix was healthy and no evidence of malignant disease was present. The uterine appendages were normal.

A diagnosis of fibrosis uteri was made, and although there was no direct evidence to suppose that the lesion was syphilitic, 10 cc. of the patient's serum were collected for the purpose of a Wassermann reaction. The test was reported positive by the Lister Institute, and the patient is now under treatment with potassium iodide. The symptoms have considerably improved within the last three months without having recourse to any local treatment.

Case v. J.B., aged 36, a 4-para, referred to me on account of irregular uterine hæmorrhage of two years' duration, by Dr. Carver, of the Birmingham General Dispensary, where she was under treatment for pulmonary tuberculosis (second stage). The patient had been married 14 years, and had had four normal labours. She gave no history of any abortions or premature labours, and she could adduce no evidence of syphilitic infection at any time. Her principal complaint was severe irregular uterine bleeding with the passage of many clots. She also suffered from constant hypogastric pain and had an offensive vaginal discharge.

On examination, I could find no evidence of any syphilitic lesions. The uterus, on bimanual examination, was small, anteflexed, hard and fibrotic. It was freely movable and the uterine adnexa were normal.

The extreme density of the uterine tissues suggested the element of fibrosis, and I therefore suggested that a Wassermann test be performed. This was done, and the reaction found positive. The patient is now under treatment with potassium iodide.

Case vi. E.D., aged 31, referred to me by one of my colleagues, Dr. Stanley Barnes, on account of irregular uterine hæmorrhage and purulent vaginal discharge. The patient gave a history of five full-term labours and two abortions. She had complained of the irregular and profuse bleeding for three months. At first she denied the possibility of any syphilitic infection, but upon close questioning referred to the fact that some years ago she had had an ulcer on the vulva which had "cured itself." On examination, a tertiary syphilitic ulcer was found on the right lateral margin of the tongue, which also showed a well-marked condition of "leukoplakia." No other signs of syphilis were present. Bimanually, the uterus was found to be small, and freely movable, but very firm and hard in consistence. It also bled rather freely as the result of the examination. The uterine appendages were quite normal. A few old "shotty glands" were noted in each inguinal region.

The patient's serum gave a positive Wasserman reaction.

Case vii. J.J., aged 27, referred to me by Dr. Pemberton Fooks, of Birmingham. The patient was a 2-para, who acknowledged the fact that three months after marriage she suffered from a general skin rash, complicated by a severe sore throat. At the same time, she had not noticed any sore upon the genitals. As regards her offspring, the first baby was still-born, and the second developed a specific rash upon the buttocks shortly after birth. The patient complained of excessive menstrual bleeding and the passage of large numbers of clots. She also had constant hypogastric pain of an aching character.

On examination, I found the uterus large and slightly tender upon palpation. Its consistence was much firmer than the healthy organ, but not so marked as in advanced degrees of fibrosis. The organ was in good position and freely movable. The appendages were quite healthy. No obvious syphilitic lesion was present upon the person of the patient, but her serum gave a well-marked positive Wassermann reaction.

Treatment with potassium iodide is being carried out, and with considerable improvement in the patient's symptoms.

N.B.—This case can hardly be classed in the same category as the preceding ones, inasmuch as a fairly definite history of syphilitic infection was obtained, and the uterus did not present on bimanual examination that excessive induration which is characteristic of well-marked fibrosis. It is possible that the case represents an earlier stage of the process and one which, if untreated, would progress to that reached in the other cases here recorded. In view of the syphilitic infection of both infants, it is also possible that living

spirochætes are still present in the tissues of the uterus. An attempt is in progress to discover these in the menstrual blood.

Note.—Since this paper was read, a communication by Dr. Carl H. Browning has been published in the *British Medical Journal,* Jan. 10 1914, on "Syphilis as affecting the health of the community." He quoted the following figures in relation to the Wassermann reaction and chronic metritis: "Out of 37 cases of this type, 20 reacted positively, and 2 others had positively reacting children—that is, syphilis was present in 59 per cent."

1. Whitehouse, Beckwith. "Notes on Uterine Hæmorrhage, with special reference to the abuse of the Curette." *Lancet,* April 27, 1912.
2. McIlroy, Louise. *British Medical Journal,* October 18, 1913, p. 1002.
3. D'Arcy Power and Murphy. "System of Syphilis," vol. i, p. 159.
4. Mott. *British Medical Journal,* No. 2759, November 15, 1913.
5. Browning and Mackenzie. "Recent Methods in the Diagnosis and Treatment of Syphilis," p. 103.
6. Knoppelmacher and Lehndorff. *Jahrb f. Kinderheilkunde,* Bd. lxxi, 1910, p. 156.
7. Ross. *British Medical Journal,* December 14, 1912.
8. McDonagh. *Proc. Royal Soc. of Medicine, Path. Sec.,* vol. vi, No. 3, January 1913.

SELECT CLINICAL REPORTS.

(Under this heading are recorded, singly or in groups, cases to which a special interest attaches either from their unusual character or from being, in a special sense, typical examples of their class.)

A Case of "Mixed Tumour" of the Uterus (Adeno-Chondro-Sarcoma)*.

By

H. Leith Murray, M.D.,

Honorary Assistant Surgeon, Hospital for Women, Liverpool; and Honorary Consulting Gynæcological Surgeon, Northern Hospital, Liverpool;

and

R. Meredith Littler, F.R.C.S.,

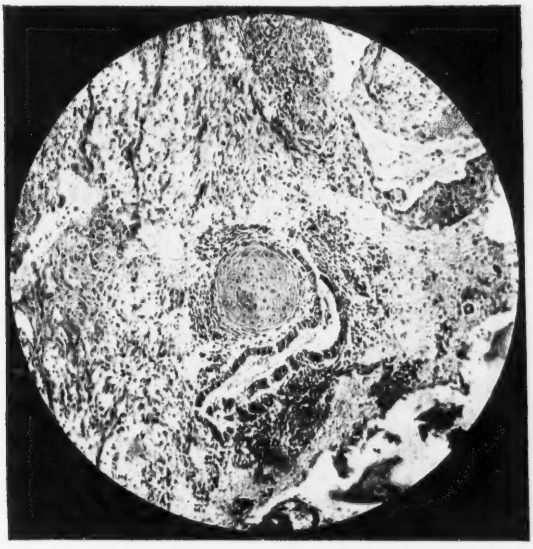
Honorary Medical Officer, Southport Infirmary.

The lady (aged 46, and unmarried) from whom the specimens were removed gave the following history:—

Menstruation began at 14, and till lately was always very regular except for five weeks of continuous hæmorrhage at the age of 26; there was no history of a missed period at this time. Two years ago, an irregularity tending towards infrequency developed, and the periods occurred at intervals of 3—9 weeks. Her last normal period took place on July 2 1913, and lasted the usual five days. On August 10 there first appeared an intermenstrual discharge—slight, very unpleasant and watery. This persisted till August 22, when she had a sensation as of "something dropping inside," and this was followed by a rather sharp flooding, which was still present when she sought advice one day later. She did not complain of pain, and appeared to be in good general health. On August 26 a vaginal examination by Dr. Littler disclosed a soft polyp projecting from the cervix. This soft and vascular mass was removed on September 1, when a closer examination of the tissue so strongly suggested that it might be decidual in nature that it was sent for microscopical examination. The following report was received:—

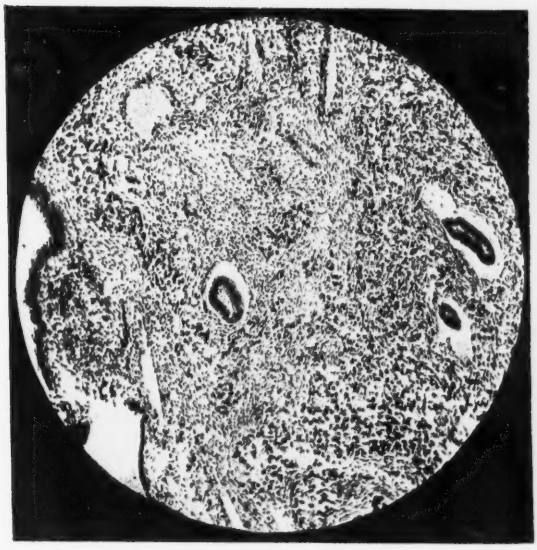
"This is a remarkable growth of a very rare type. It has very mixed characters, being composed of connective-tissue, sarcoma-like structures, gland tubules and small nodules of cartilage. Its general appearance is essentially the same as the common embryoma of the testis or ovary. These tumours have usually been called teratomatous

* Read on December 19, 1913, before a meeting of the North of England Obstetrical and Gynæcological Society.



× 120.

Fig. 1. Section of the polyp showing an island of hyaline cartilage, a gland and "myxomatous" tissue.



× 120.

Fig. 2. Section of the polyp showing columnar epithelium covering the surface; glands in transverse section and sarcomatous tissue.

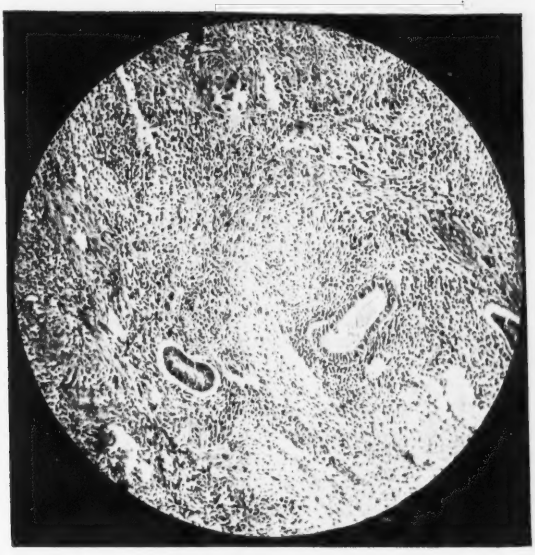


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Fig. 3. Section of the neoplastic tissue within the uterus showing glands imbedded in a malignant stroma.

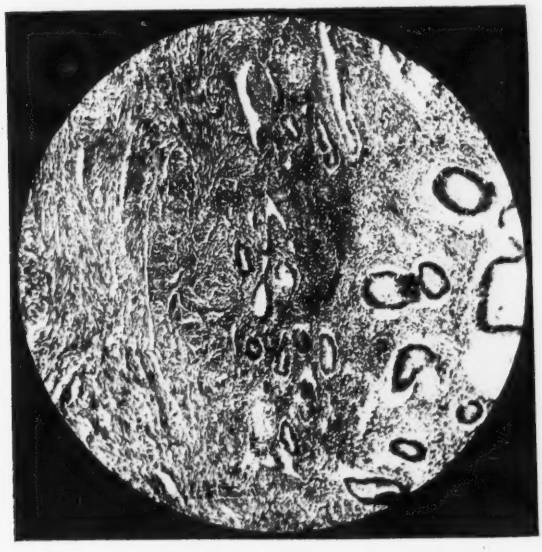

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Fig. 4. Section showing the junction of the endometrial growth with the muscularis. Microscopically there is no evidence of malignancy in the deepest layer.

or 'mixed' tumours of the uterus and are always malignant." (Clinical Research Association.)

Accordingly, on September 12, in a nursing home, a panhysterectomy through a median incision was performed by Dr. Leith Murray. The operation was a straightforward one, and a wide pelvic dissection was readily possible after the ureters had been isolated. The only difficulty experienced was in the separation of the bladder from the anterior wall of the uterus; at one point, rather to the left side, gauze pressure failed to bring the bladder away, and a small hole was made into the bladder in the attempt. This was at once sutured and gave no further trouble.

The specimen was removed with the vagina clamped across, and the lower cut edge of this latter was thoroughly iodized. A small gauze drain was placed from above, the vaginal lumen contracted by lateral stitches and the peritoneal flaps sutured from end to end. No enlarged glands either iliac, lumbar, paracervical or obturator, were discovered. Catgut alone was used and the abdominal incision was closed in layers. Fowler's position was adopted and a catheter was tied in for four days. The patient had a pulse of 90 as she left the table, made an uninterrupted convalescence and so far has remained well. Should any recurrence appear it will be reported.

Macroscopical Appearances.

The polyp is a reddish, bean-shaped mass measuring $2 \times 2 \times 3$ cm. It is lobulated on the surface, has one sulcus running well into the substance and is soft and brain-like in consistence.

The cut section shows a pale brain-like stroma with small areas of engorgement and of extravasation. There are no cysts, nor is there any evidence of the minute islands of cartilage visible under the microscope.

The specimen removed at operation consists of uterus and appendages with a narrow cuff of vagina.

In size and general contour the uterus resembles a multiparous uterus; it is 8·5 cm. long and shows no irregularity or other external abnormality. The cervix is closed and nulliparous. Both Fallopian tubes appear normal. The right ovary is distended to the size of a pigeon's egg by a follicular cyst into which some hæmorrhage has occurred; there are also several small blood cysts, and on the lower edge is seen a small flat papilloma measuring 5 mm. across. In the left ovary there are also several small blood cysts.

The uterus, opened from behind by a vertical incision, presents the following appearances:—The cavity of the cervix is normal in every way and shows the usual corrugated endo-cervical membrane. The cavity of the body is distorted by an irregular growth replacing the endometrium. This occurs as a series of irregular bosses measuring from $\frac{1}{2}$—1 cm. in thickness and 1—3 cm. in length. The tissue

linking up these bosses is everywhere thicker than the normal endometrium. The most prominent boss is found encircling three-fourths of the lowest limit of the corporeal cavity. From its tendency to sag downwards it suggests the earliest stage of polyp formation. In cut section these bosses and the intervening tissue are pale and brain-like in colour except on the surface where there is a diffuse and superficial ecchymosis. While resembling brain tissue in appearance the growth is distinctly firmer and suggests rather the consistence of very soft indiarubber. It is not at all friable except in the superficial layers where hæmorrhage has occurred. All parts of the growth appear to be homogeneous both in colour and in texture. The stump of the polyp which made the diagnosis possible is clearly visible on the anterior wall about $1\frac{1}{2}$ cm. from the internal os. There are no bosses at the fundus, but here also there is evidence of thickening of the endometrium or what corresponds to it.

The growth shows, in one or two places near the cervix, a very clear differentiation from the muscularis, and may, indeed, be described as "lying on it" a blunt dissector readily separates the two. The line of separation, however, is not a very straight one, and in all other areas the demarkation is much less definite. There are no macroscopic secondary deposits in the muscular wall.

Microscopical Appearances.

The polyp is very representative of the growth remaining in the uterus at the time of operation, and its microscopical appearances are as follows:—A rapid survey shows a remarkably heterogeneous collection of tissues ranging from simple connective-tissue through varying degrees of malignant spindles to an irregular-celled sarcoma, tissue resembling myxoma, hyaline cartilage, gland-tissue and perhaps fat.

The stroma as a whole is loose and tends in places to appear "myxomatous"; we prefer, however, to designate this change as an œdema, for no true myxoma staining reactions were found.

Certain areas show an apparently simple connective-tissue—particularly in a few layers round the islands of cartilage, but also as indefinite bands across the polyp; a sparse deposit of inflammatory round cells is visible throughout. All the gradations from a fibro-sarcoma to a short and fat spindle-celled sarcoma and from this to an irregular (tending to round) celled sarcoma are visible. These latter are not, in our opinion, spindles which have been cut transversely, for the cell bodies are occasionally too large; their nuclei, however, as a rule tend to be oval. No giant cells are seen. There is throughout the stroma a certain tendency to a more or less concentric arrangement; in this a mass of somewhat degenerated cells with much intercellular substance is surrounded by a zone of condensed short spindles, and these again by a looser area of more active cells.

The vessels are numerous, and the wall in the vast majority of cases consists merely of a single layer of cells of irregular shape and undoubted malignancy. A few vessels with a more definite and innocent lining are visible as a group at one side of the polyp. Extravasation of blood is frequent, and this has occurred both into the stroma and into the gland spaces. These gland spaces are much in evidence throughout. They are lined by a single layer of columnar epithelium very much resembling the normal endometrial glands; in cross section many are indistinguishable from these, while others show much irregular dilatation. The largest gland spaces—usually filled with blood—are lined with cubical epithelium. A basement membrane is readily made out. The stroma surrounding the gland-tissue is invariably of the very short spindles variety. The surface of the polyp is covered, in places, with a single layer of columnar epithelium identical with that found lining the smaller glands.

Dotted throughout are islands of hyaline cartilage varying in size from 5 micros. to 2—3 millimetres; the smaller ones are cellular and well formed, but the larger give the appearances of old cartilage and are sparsely cellular. Each island is surrounded by a zone of condensed tissue. At one spot a group of cell-spaces suggesting fat cells is seen, but as the polyp was preserved in alcohol this cannot be confirmed. A careful search reveals no striped muscle. The neoplastic tissue in the uterine cavity is very similar, but shows more gland-tissue, very little cartilage and very little "myxoma." There is extravasation of blood and dilatation of the glands in the superficial layers. The surface is covered except over the bosses with columnar epithelium. The deepest levels show only gland-tissue, and this lies in the musculature very much as normal endometrial glands do and penetrate scarcely further than do these in certain cases. We incline to the opinion that these may be the normal uterine glands which have resisted the conversion of the stroma into a malignant tissue. Certainly they are microscopically indistinguishable. They are not unduly plentiful, and in places they cover in the tumour exactly as does the normal endometrial epithelium. Even the thinnest layers of the lining-tissue—such as the fundus—show areas of sarcomatous spindles. There is no evidence at any point of secondary deposits in the muscular wall.

Sections of the tubes show no abnormality. The papilloma of the right ovary is a superficial one and absolutely simple; several follicular cysts—occasionally with hæmorrhage—are visible. Near the hylum there is seen a glandular structure consisting of a sinuous tubule lined with several layers of columnar epithelium. There is no inflammatory deposit around it, and we are not disposed to regard it as malignant, but rather as an embryonic remnant. The left ovary shows a few follicular cysts with hæmorrhage.

Sections were made of the limited area where there was difficulty in separating the bladder, but nothing abnormal can be seen.

"Mixed tumour of the uterus" is a very rare condition. The only structures occasionally found in these tumours and not present in our case are striated muscle and giant cells.

Puech and Massabuau, in 1908, were only able to collect twelve cases from literature. Their own case is described as an adeno-myxo-chondro-sarcoma, a title which might well be applied to our specimen. It contained patches of hyaline cartilage in the midst of a dense stroma of connective-tissue and gradations between that and sarcoma cells. They are of opinion that rapid recurrence is the rule, and consider the most plausible theory to be embryonal remains of a chondrogenic character.

Piquand, in a study of 151 cases of sarcoma of the mucosa of the uterine body, found that cartilage was noted only in two cases (Wagner and Geisler). In one of these the sarcoma penetrated to the peritoneum and thus caused death; in the other, secondary deposits were observed in the lungs at post mortem, and these also contained cartilage.

Piquand further describes sarcoma of the mucosa of the uterine body as tending to develop along the surface of the uterine cavity. This was very evident in our case. He, however, notes that the growth sometimes penetrates the uterine wall, but of this we found no evidence in our specimen.

The tubal openings and later the tubes themselves are said to be quickly obliterated by neoplastic tissue. Metastases, according to Gefsaner, occur late and in about 25 per cent. of cases.

1905. Piquand. *Rev. de Gyn.*, vol. 9, p. 387.
1908. Puech and Massabuau. *Gaz. de Gyn.*, 15th May. Quoted in *Amer. Journ. Obstet.*, vol. 58, p. 524.

A Case of Peritoneal Implantation of an Ovum.

By Miles H. Phillips, B.S., F.R.C.S.,

Honorary Surgeon, Jessop Hospital for Women, Sheffield.

The following is a description of a case in which an early ovum was found implanted in the subperitoneal connective-tissue on the side wall of the true pelvis.

Abdominal section had been performed for profuse intraperitoneal bleeding. As blood was oozing from amongst the fimbriæ of the left Fallopian tube, this tube was removed. Later on careful examination of the tube showed that the bleeding was due to the presence of small areas of trophoblast and early chorionic villi situated at the bases of two of the fimbriæ, but there was no complete implantation sac. On the other hand, a hæmorrhagic nodule, with a peritoneal covering, which was excised from the lateral pelvic wall, has been found to contain an early ovum completely embedded in the extraperitoneal connective-tissue.

History of the illness and operation. The patient was 35, and a ii-para, the younger child being six years old. Her last proper period began on the expected day, but lasted ten instead of the usual seven days. A week later a second loss began and lasted for ten days; it was not profuse, but it was accompanied by some abdominal pain. There had been no loss for eight days, and the patient was apparently quite well, when, at 2-30 a.m., she was seized with acute abdominal pain. She became "faint and white, cold and clammy," but soon rallied, and a doctor was not sent for. Several slighter attacks occurred during the next few hours, and she also had almost constant rectal tenesmus. When I saw her she presented a typical picture of intra-abdominal bleeding. On vaginal examination an excessively tender boggy swelling could be felt behind the uterus. She was sent into Hospital, and two hours later I opened the abdomen.

Clot and liquid blood escaped in large quantity. A hand was at once passed into the pelvis and the uterus drawn up. No adhesions were recognized. Neither tube felt enlarged. On closer inspection bright blood was seen to be oozing from amongst the fimbriæ of the left Fallopian tube, but not from the ostium. There was a small piece of adherent blood-clot, but no visible fimbrial gestation sac. The whole tube, which was slightly thicker than normal, was at once clamped off by forceps. The parts were then closely examined. The

right tube, though "on the large side," appeared normal. Both ovaries were normal, but neither showed a corpus luteum. The left was the larger; neither was removed.

Blood-clot was scooped out of the pelvis, and the left tube was then removed. Whilst swabbing out the pelvis preparatory to closure of the abdomen, my senior colleague, Mr. Richard Favell, drew my attention to a small dark, blood-clot like nodule, on the left wall of the true pelvis. It was situated $\frac{3}{4}$ inch below the pelvic brim and at about the site of the "fossa ovarica." It was ovoid and projected $\frac{1}{2}$ inch above the general peritoneal surface. It was covered with peritoneum, and there was no clot adherent to it, nor any blood escaping from it. It was easy enough to cut the thickened œdematous-looking peritoneum just outside the swelling and to raise the nodule from its connective-tissue bed. Only slight bleeding occurred, and the little wound was easily closed by suture. Fig. 1 shows, as closely as possible, the relative position of the structures.

Saline was poured into the abdomen before it was closed. A quick recovery followed, and the patient was able to go home on the seventeenth day. (Three years later she bore a full-term child.)

The Specimens.

(*a*) The peritoneal mole (see Fig. 2). The nodule was ovoid in shape, rather less than 1 inch in length, and about $\frac{3}{4}$ inch in breadth and thickness. The superficial aspect was, in great part, covered by smooth glistening peritoneum of slate-grey colour. This serous coat was split for half an inch, forming a narrow rent which exposed an underlying granular material of purplish colour, suggestive of old blood-clot. The other portion of this surface, uncovered by peritoneum, was a slightly raised oval area, with its long axis ($\frac{1}{4}$ inch) at right angles to that of the main nodule and at one end of the nodule. This had a slightly granular surface and a few small tags of fibrin were attached to its margin. Microscopical examination has shown that it was made up chiefly of blood-clot and evidently formed the plug blocking up the point of entrance of the ovum. The deep aspect of the nodule was covered by small lobules of fat and areas of œdematous areolar tissue. The whole nodule was cut in serial section (over 1,700) at right angles to its long axis; every tenth section was stained. These show marked dilatation of the blood-vessels, in both the subperitoneal tissue and in the fatty areolar layer. The main bulk of the nodule consists of blood-corpuscles and areas of fibrin. In the middle portion (sections 810—940) lies the ovum; it is placed rather nearer the fatty base than the peritoneal covering and well to one side of the middle line. It is compressed laterally and distorted. Its longest axis appears to be in the plane of the section and measures 1·5 mm. There is no embryonic rudiment but simply a blastocyst with its external covering of cyto- and

Fig. 1. Showing approximate position of the peritoneal mole. (×)

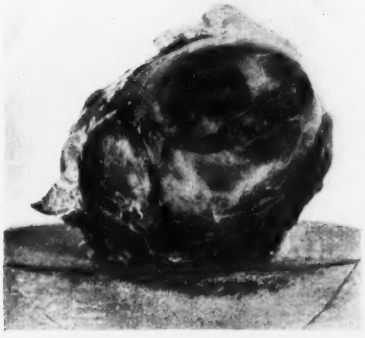


Fig. 2. The peritoneal mole. (× 2·5)

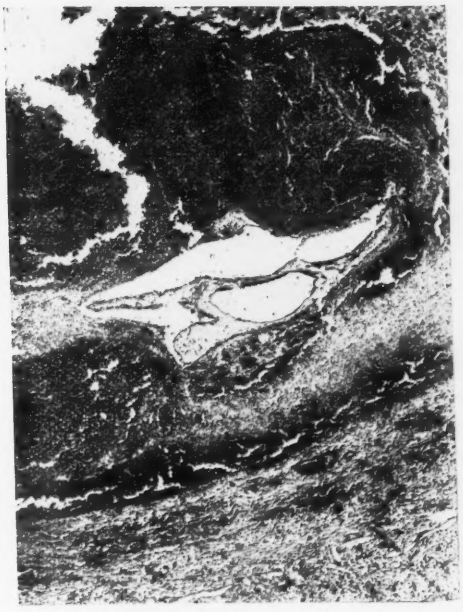


Fig. 3. Microphotograph of ovum and part of implantation sac, showing three villi. (× 40).

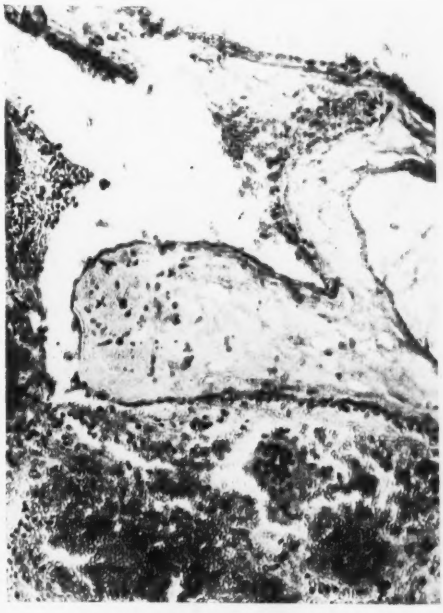


Fig. 4. Microphotograph of part of ovum, showing cyto-trophoblast, and a syncytial mass. (× 200).

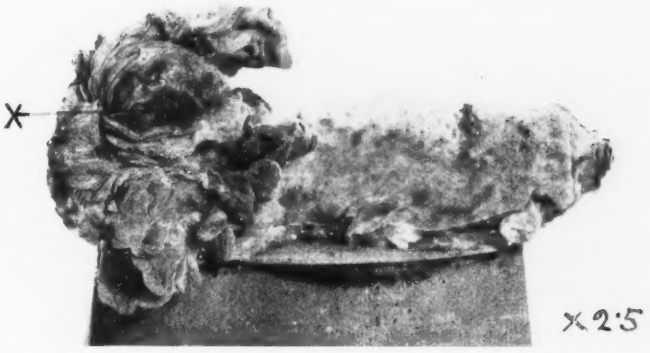


Fig. 5. The left Fallopian tube, showing the fimbrial blood clot. (×).

Fig. 6. Microphotograph of the fimbrial portion of the implantation sac. (× 9).

Fig. 7. Microphotograph of the fimbrial portion of the implantation sac, showing chorionic villi and layer of Nitabuch's fibrin. (× 40).

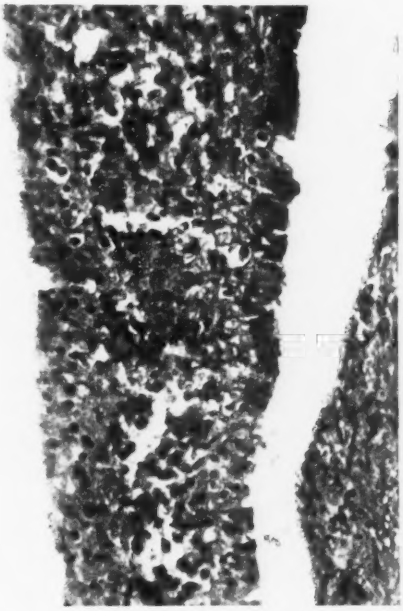


Fig. 8. Microphotograph of fragment of tubal fimbria, adherent to the fibrin plug of the peritoneal mole. (× 440). Shows the columnar epithelium and the engorged stroma.

plasmodi-trophoblast in single and multiple layers, and a mesoblastic core of a poorly staining matrix with occasional stellate cells. In its centre is an ovoid space outlined by slight condensation of the matrix but with no cellular lining (see Figs. 3 and 4). The trophoblast and stroma show localized projections indicative of early villous formation.

The ovum is surrounded by a lacunar space containing blood-corpuscles and bordered by a layer of fibrin of varying thickness. This contains a few areas of plasmodium and cyto-trophoblast. Both the trophoblast and the matrix stain poorly, and suggest a low degree of vitality, very different to that of the trophoblast, to be described later, which is to be seen in the fimbrial end of the tube. The fibrin plug (sections 1470 to 1680) contains, as well as blood-corpuscles, several areas of plasmodium and occasional "shadows" of young chorionic villi. There is also, in a few sections, a portion of a tubal fimbria which shows conclusively that the tube must have been, at one time, adherent to the peritoneal mole. Finally, in the sections of the blood between the implantation sac and the fibrin-plug small isolated portions of trophoblast are to be found.

(*b*) The Fallopian tube (see Fig. 5) was slightly thicker than normal, the fimbriæ being distinctly swollen. The abdominal ostium was of normal size. Just to the inner side of the ostium and at the base of a cluster of fimbriæ is a small slightly raised nodule, reddish-brown in colour and $\frac{1}{4}$ inch in diameter. The outer half of the tube was cut in serial section, and it was thus shown that the little nodule consists essentially of blood-clot. In a few sections there are small tags and string of fimbrial epithelium. The clot is loosely attached to the tube wall over a small area between the bases of two fimbriæ, the covering epithelium having disappeared over that area. In the tissue immediately beneath are several portions of chorionic villi (never more than three in any one section) and small clusters of cellular and plasmodial trophoblast. These lie in or help to form the wall of a lacunar space filled with blood. Deeper still is a complete wall, of varying thickness, of fibrinous material. There is considerable engorgement of the blood-vessels in the immediate neighbourhood and well-marked decidual reaction in the stromal cells of the nearer fimbriæ (Figs. 6 and 7).

The trophoblast cells stain well and suggest the power of active growth, yet they are not in sufficient number to lead to a suspicion of chorionepithelioma. The rest of the tube wall is quite normal, the lumen is empty and the plicæ healthy.

These appearances suggest that the fimbrial end of the tube has formed part of the implantation site of an ovum, that it has been separated from the ovum and the rest of the implantation site, but has retained a few villi and a certain amount of active trophoblast.

This has continued to grow and to erode blood-vessels, finally causing severe intraperitoneal hæmorrhage.

We have already seen that the fibrin-plug of the peritoneal mole contains a tell-tale portion of a tubal fimbria, and we are forced to the conclusion that the ovum was originally implanted on a fimbrio-peritoneal site, probably as the result of a pre-existing adhesion between the tube and the parietal peritoneum.

When the separation occurred it is impossible to say, but the appearances, both at the time of operation and on microscopical examination, strongly point to it having occurred some considerable time previous to the severe hæmorrhage.

A Fatal Case of Puerperal Infection with the Bacillus Aerogenes Capsulatus.*

By Daniel Dougal, M.D.,
Resident Obstetric Officer, St. Mary's Hospitals, Manchester.

The patient, a married woman, aged 31, and in the eighth month of her pregnancy, was admitted to St. Mary's Hospital suffering from ante-partum hæmorrhage, and gave a history of two weeks' bleeding previous to admission. During this time she had been under the care of her family doctor, who had arrested the hæmorrhage by means of vaginal tampons.

The general condition of the patient was fairly good, although she looked somewhat pale and had evidently lost a considerable amount of blood. Her pulse and temperature were normal.

On examination, the vagina was found to be packed with several gamgee tampons which had evidently been there for some days, and were consequently extremely offensive. They were removed at once, and the vagina carefully swabbed out with an antiseptic. The cervix admitted the tip of the finger, but no placenta could be felt, and there was no bleeding during the examination; the vertex was presenting, but the patient was not yet in labour. The case was evidently one of accidental hæmorrhage, and as the bleeding had now ceased it was decided to keep the woman under observation until labour commenced.

Twenty-four hours after admission the vagina was again swabbed out; the general condition remained about the same; there had been no further loss and labour had not yet come on. A few hours later, however, the pains commenced and delivery was completed naturally within six hours.

The child was premature and stillborn, and presented a shrivelled appearance, being macerated and in addition having an extremely offensive smell. The placenta and membranes, also extremely offensive, were delivered naturally, but before they came away there was some hæmorrhage and the blood was noticed to contain a large number of gas bubbles. The uterus and vagina were carefully douched out with an antiseptic and the patient put back to bed. Within half an hour she was suddenly seized with a rigor, her temperature rose to 101°, and her pulse to 140. Strychnine was given, and she got much better and went to sleep.

Twelve hours after delivery the temperature was normal, the pulse 108, and the patient felt considerably better, although complaining of some pain in the hepatic region. Five hours later she had a second rigor; her temperature rose to 103°, her pulse to 136, and the pain became much more severe and localized over the

* Read before the North of England Obstetrical and Gynæcological Society, December 1913.

liver and right kidney. The breathing became very rapid, the pulse got progressively weaker, and the woman became very collapsed and cyanozed. A catheter was passed and eight ounces of blood-stained urine drawn off. The general appearance at this stage was very striking, the skin having a marked icteric hue and a large patch of purplish discolouration being present on the right side of the chest.

The patient became rapidly worse, and died within half an hour of the commencement of this attack and eighteen hours after the termination of labour.

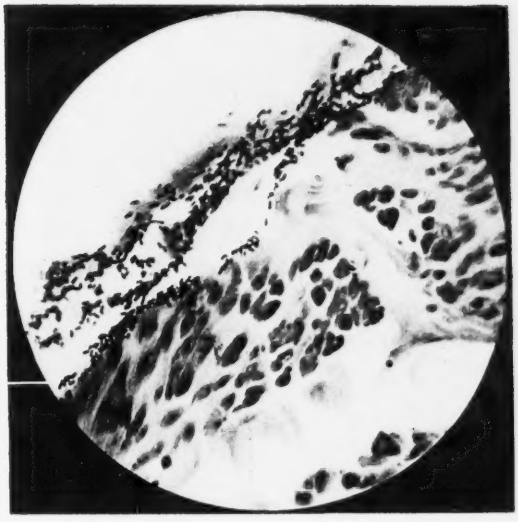
The pain was extremely severe up to the very end, and before death the discolouration of the skin was much increased. Death was evidently due to an extremely virulent type of septicæmia, but it was not until a post mortem examination had been made that the exact cause was determined.

The post mortem examination was performed seventeen hours later, and in cold weather. The body was swollen to twice its normal size owing to the general emphysema present, the skin surface being bright yellow in colour with areas of a deeper purplish tinge. On making an incision into the arm, bubbles of gas escaped from the subcutaneous tissues and also from the cut ends of the superficial veins. The abdomen was enormously distended, and on opening the peritoneal cavity there was a great rush of offensive smelling gas; the tissues of the abdominal wall were also saturated with gas bubbles and the peritoneal cavity contained a considerable quantity of blood-stained fluid. The whole of the internal organs of the body presented similar and characteristic appearances, gas-containing cavities being present in large numbers throughout their structure. The uterus was pale in colour and showed numerous gas bubbles under its peritoneal covering; a crepitating sound was heard on handling the organ, and on cutting into it numerous gas bubbles escaped from its muscular walls. Both kidneys were slightly enlarged, the capsules being quite free and in some places widely separated from the cortex by large blebs containing gas. Both cortex and medulla were deeply injected and riddled with small cavities. Gas was also present in the pelvis of each kidney and in the right ureter. The liver was enlarged, darker in colour than normal, and its cut surface had an appearance exactly similar to that of Gruyère cheese owing to the large number of gas-containing cavities throughout its structure.

Smears were obtained from the fresh-cut surface of the various organs, and on staining with methylene blue revealed the presence of enormous numbers of large bacilli having all the characteristics of the bacillus aerogenes capsulatus.

On examining stained sections from the different organs the same bacilli were found present in large numbers and lining the numerous ragged cavities produced by the evolution of gas.

Sections were also cut from the liver and lung of the fœtus, and



Microphotograph of section of Uterus.

Microphotograph of section of Fœtal Lung

these presented similar appearances to those found in the maternal organs, thus demonstrating the existence of the organisms in the tissues of the child.

The accompanying microphotographs show sections, stained by Gram's method, from the uterus of the mother and lung of the fœtus respectively.

The sequence of events in the case appears to me to be as follows: Two weeks before admission to Hospital the patient commenced to bleed owing to separation of the placenta, and the vagina was therefore packed. This packing became infected with the bacillus aerogenes capsulatus, which is extensively present in the rectum and on the skin around the anus. The organisms made their way up to the maternal surface of the placenta along the channel formed by the escaping blood, their growth being favoured by the decomposing blood-clot present.

By this time the child was in all probability moribund owing to the amount of placental separation, and the organisms were therefore able to gain a firm footing here and to enter the fœtal circulation before death took place. With the death of the child, the bacilli increased rapidly in numbers and virulence so that by the time the labour commenced the mother had a pure culture of exceedingly virulent organisms within her uterus. During or immediately after labour these gained an entrance into her circulation through the large sinuses in the uterine wall, with the result that a rapid septicæmia developed from which she succumbed.

It is interesting to speculate on the extent to which it is possible for an anærobic organism such as the one under discussion to exist and grow in the oxygen containing blood of the maternal circulation, but I think there is no doubt that the bacilli were present and did multiply during life in the present case, as enormous numbers must have been thrown into the blood-stream at one moment and their virulence had been greatly enhanced by their passage through the tissues of the dead child.

The bacillus aerogenes was first described by Welch and Nuttall in 1891, and these authors made many careful inoculation experiments, with results which are important in the present connection. They found that the organism was not pathogenic for healthy animals under ordinary conditions, but only developed and produced the characteristic appearances after death. In only one case did death actually occur as the direct result of the inoculation, and here the animal, a rabbit, was found to be pregnant, there being six embryos in the uterus and definite evidence to show that two of these had been already dead at the time of the inoculation. The animal died in eighteen hours and appeared to be quite well half an hour before death. This experiment is therefore specially interesting as it provides an almost exact parallel to the present case.

The essential factors co-operating towards a fatal result appear to be as follows:—

1. The use of vaginal packing introduced with faulty antiseptic precautions and allowed to remain in the vagina for some days.

2. Hæmorrhage from the placental site providing a favourable channel along which the organisms may enter and gain a footing in the fœtal circulation.

3. Weakly condition of the child, in this case due to placental separation, making it a more ready prey for the invading organisms which enter its circulation before death, and after this has occurred, increase enormously in numbers and virulence.

4. Inoculation of the mother with a pure culture of the virulent organisms, a favourable moment for this occurring at the end of labour when the large sinuses in the uterine wall have been opened up.

As a result, a rapid septicæmia develops and leads to a fatal termination within a very short period, extensive hæmolysis having occurred before death, and also some amount of gas formation, the latter accounting for the respiratory embarrassment and for the excruciating pain over the hepatic region. In fact, the sudden onset and short duration of the fatal seizure strongly suggest gas embolism as being the immediate cause of death, the formation of gas only occurring when the organisms have gained a certain concentration in the mother's tissues.

Whilst in St. Mary's Hospital the patient was under the care of Dr. Walls, and I wish to express my thanks to him for permission to publish the details of the case.

Excessive Separation of the Recti Muscles and Hernia of the Abdominal Contents in a Woman Suffering from Myxœdema.

By J. Nigel Stark, M.D., C.M., F.R.F.P.S.E.,

Surgeon to the Royal Samaritan Hospital, Glasgow.

Wide and almost complete separation of the abdominal recti muscles is rare, unless there has been previous median incision for operative purposes. I therefore report a case, recently seen, which presented, in addition other features of interest.

The patient was 46 years of age. She had given birth to eleven children, the eldest being 22 and the youngest 5 years old. She therefore had borne all her eleven children in seventeen years, and all of them had been delivered by forceps. The puerperia had, however, been normal in every case, an amazing fact when we realise the conditions under which they had occurred, the patient being a coal-miner's wife, and the whole family living in a one-roomed cottage in which coal was stored under the bed and bathing facilities were totally absent. Menstruation had always been normal, but had ceased two years previously, and it was about this time that the abdomen began to swell. It is not possible to be certain of the date, however, as patients of this class are very unobservant of their personal appearance and very hazy with regard to dates. In any case, the swelling had for several months caused discomfort and disability on account of its large size.

Dr. Steele, Hamilton, recommended her to enter my wards in the Royal Samaritan Hospital, and she was admitted on October 7 1913.

Her appearance was noteworthy. The face was somewhat puffy, and there was cyanosis of the lips and a pinkish colour on the cheeks. The skin of the whole body after it had been scraped clean by the nurses was noticeably very dry and harsh; the hair was scanty and brittle. Thought and speech were slow in responding to the stimulus of conversation. There had been no digestive disturbances; she ate well. The pulse was regular in time but irregular in force, and the apex beat of the heart was in the sixth inter-space, five inches from the middle line. No cardiac murmurs were heard. A slight trace of albumen was present in the urine. The condition of the anterior abdominal wall can be better realized by the photographs than by verbal description. The skin looked thin and stretched almost to breaking point while over it coursed greatly distended veins. A fluid thrill was distinctly felt. The abdominal swelling was tense and dulness was elicited by percussion in the flanks.

There was some difference of opinion in the Hospital as to the presence or absence of an ovarian cyst, but my diagnosis was that probably there was no other condition than ptosis of the abdominal contents between the separated recti muscles along with free ascitic fluid. I thought it would be wise to make a small incision, drain off the fluid and explore with a couple of fingers the abdominal cavity, and accordingly this was done on October 16. Over nine pints of fluid drained away and no cyst was present. The intestines were prolapsed and, along with the parietal peritoneum, were congested. The liver felt much enlarged and was displaced downwards. After the fluid had been drained off, the edges of the recti were found to be seven inches apart. A good recovery was made from the little operation, and as it was evident that myxœdema existed, thyroid extract was commenced four days afterwards. Later on a large well-fitting abdominal belt was got, and the patient left the Hospital on November 11. She was much improved in every respect, looking and feeling brighter and more alert. The cardiac condition was better, and the skin was less œdematous.

I heard from Dr. Steele on December 25, and he says that he can now find no trace of ascitic fluid in the abdomen, that the belt is of great assistance and comfort, that " her speech is more natural and her skin less fish-like. She feels very much better and certainly looks quite lively."

It will be agreed that no operation of any sort could have been performed for the relief this condition. An attempt to excise superfluous skin and appose muscles and fascia would have, without question, failed, if not immediately, yet in the not distant future, and a thinned-out cicatrix would be found an ineffective and a dangerous substitute for skin. The abdominal belt, specially and strongly made, has proved to be an inestimable boon.

The thyroid extract also is working wonders, and it is not unlikely that with the practical disappearance of the myxœdematous condition there will be further improvement in the tonicity of the skin and less abdominal protrusion. The presence of the ascitic fluid may be ascribed to the dragging upon the vessels within the abdomen and retardation in the portal venous system; it may therefore not re-accumulate so quickly, and may be of negligible quantity under the combined good effects of the belt and the thyroid gland extract.

Evidently more than one factor has contributed to the production of the abdominal condition, but the greatest part has been played by the very rapid bearing of so large a family. It is easy to see that after separation of the muscles begins the process must progress if no attention is directed to the condition and if no measures are adopted to repair it in the early stage. The patient in this case was so apathetic and unobservant that she only sought advice when she was unable to bend her body forwards and was thus prevented from

doing her housework. For many years the discomfort of the repeated pregnancies with the pain and suffering of the abnormal labours, the never-ending monotonous toil demanded by the daily requirements of her family, and the cramped, sordid surroundings had all bred in her a state of acquiescent indifference to her own clamant bodily needs. Excuses can be made, and even, in some measure, praise can willingly be given, but yet it remains that her body was disfigured and her activities crippled before advice was sought and until palliative treatment could alone be adopted.

Lipomatosis of a Fibromyoma of the Corpus Uteri.*

By Gordon Ley, F.R.C.S. (Eng.), M.R.C.P. (Lond.).

The specimen was removed from a parous woman of 54, on August 15 1913. Her menopause had occurred six years previously, but for the last year hæmorrhage had recurred, and at the date of operation she was losing twenty-one days in every month. She had no pain. The tumour gave the physical signs of a fibroid uterus, and was removed by Dr. Drummond Maxwell. The patient was not a fat woman.

Macroscopic Appearance of Specimen.

The specimen is a uterus removed by subtotal hysterectomy. It measures 13 centimetres in length, by 12 centimetres from cornu to cornu. A rounded tumour, measuring 12 centimetres in diameter, lies in the muscular tissue of the posterior wall, widening and lengthening the uterine cavity. The endometrium is smooth. On section the tumour is composed of closely-set rounded nodules ranging from one to three centimetres in diameter. The smallest of these are white and have the typical appearance of fibromyomata; those of intermediate size are white with yellow streaks running through them; the largest are yellow and homogeneous. The nodules are separated by strands of pinkish, vascular tissue. The tumour is sharply demarcated from the surrounding muscle.

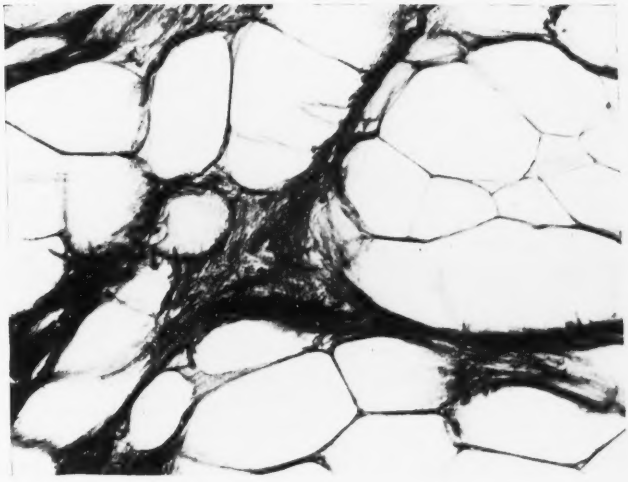
Sections were taken and stained with Ehrlich's hæmatoxylin and eosin, and with Weigert's iron hæmatoxylin and van Gieson. Other pieces were frozen and sections stained with Sudan III and Ehrlich's hæmatoxylin.

Microscopic Appearances.

The sections stained with hæmatoxylin and eosin and hæmatoxylin and van Gieson show a fibromuscular tissue consisting of narrow bundles of muscle separated by coarse strands of collagen fibre. This tissue is only seen in parts of the section. For the most part the section is made up of fat envelopes separated by narrow strands of collagen fibre or occasionally broader strands of collagen fibre and muscle. The nuclei of the muscle cells are stained clearly throughout the section and the muscle fibres are uniform in size and shape. The collagenous stroma is, in parts, slightly œdematous.

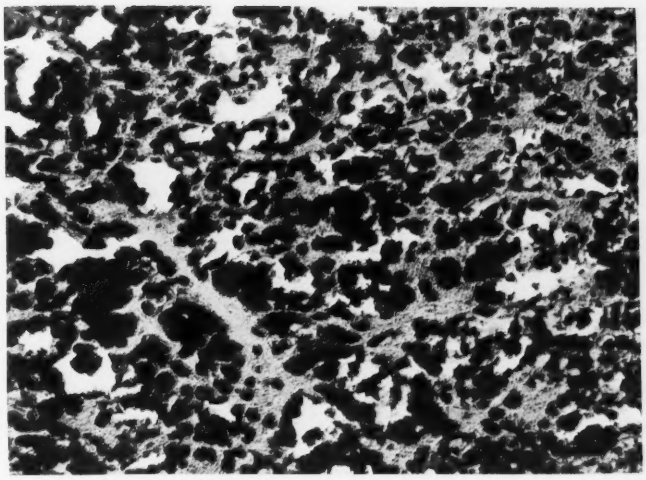
In the sections stained by Sudan III and hæmatoxylin, each fat envelope is seen to be filled by one large globule of fat. A flattened nucleus can be seen in the periphery of many of the envelopes. There

* Read before the Obstetric Section of the Roy. Soc. Med., Jan. 8th, 1914.



Lipomatosis of fibromyoma of the corpus uteri.
Mag. 125 diam.

Lipomatosis of fibromyoma of the corpus uteri.
Mag. 25 diam.



Lipomatosis of fibromyoma of the corpus uteri stained by Sudan III.
Mag. 25 diam.

are no granules or globules of fat in the cells of the tissue between the envelopes.

Remarks.

The macroscopic and microscopic appearances of the tumour are those of a fibromyoma containing fat. The fat is present in the form of large globules, each of which distends a cell. These cells are in the form of signet rings; the appearance of the fatty tissue being similar to that of normal lipomatous connective-tissue. Fine granules of fat, such as are characteristic of degeneration, are present neither in the muscle nor in the connective-tissue cells, nor is there evidence of any other degeneration of the cell elements. There is, therefore, no evidence that the lipomatous tissue is an expression of fatty degeneration, such as is frequently seen in degeneration of fibromyomata, especially in calcareous impregnation and in hæmorrhagic necrosis. The tumour is either a fibro-myo-lipoma, or is a fibromyoma with fatty metamorphosis of the fibrous stroma. The absence of young fat granule cells and, more especially, the distribution of the lipomatous tissue are strongly in favour of the latter interpretation.

The literature on this subject is extremely scanty, all authorities stating that fatty changes in fibromyomata are extremely uncommon. Only one other instance of this condition has come under my notice. This is now in the Museum of St. Bartholomew's Hospital. It was placed there by Sir James Paget. It consists of a pedunculated fibromyoma with a small, well-defined, encapsulated yellow tumour embedded in the centre of its substance. It was removed from a woman of fifty. Its growth had given rise to no trouble, but it suddenly protruded from the vagina during defæcation and was, therefore, removed. I have not seen a microscopic section of this tumour, but Dr. Griffith tells me that it is a lipoma in a fibromyoma.

My best thanks are due to Dr. Drummond Maxwell for permission to publish this case; to Dr. Hubert Turnbull, Director of the Pathological Institute of the London Hospital, for kind assistance, and to Dr. Griffith for his kindness in giving me particulars about the St. Bartholomew's specimen.

Endothelioma of the Cervix.

By A. Donald, M.D., M.R.C.P.,

Professor of Obstetrics, Manchester University; Honorary Gynæcological Surgeon, Manchester Royal Infirmary; Honorary Surgeon for Women, St. Mary's Hospital, Manchester.

The patient was an unmarried woman of 25. She had been complaining for some months of irritation and of a smarting pain in the vagina. For five or six weeks there had been a leucorrhœal discharge, and for about the same length of time she had suffered from metrorrhægia. Previous to admission to the Manchester Royal Infirmary the hæmorrhage had lasted for three weeks without cessation.

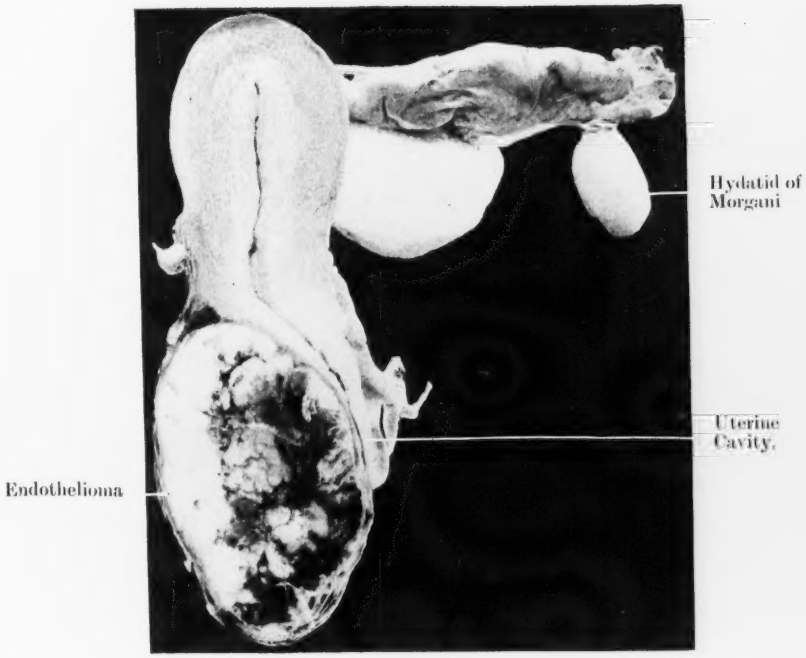
On examination a rounded swelling was felt in the anterior lip of the cervix, projecting on the vaginal portion of the cervix and into the cervical canal. The posterior lip of the cervix was stretched over the growth. It was at first thought to be a cervical fibroid, and an operation was undertaken for the purpose of enucleating it. When the growth was seized by vulsellum forceps it was apparent that the tissue was not firm enough for fibroid tissue, and it was then decided to remove the uterus by abdominal panhysterectomy. The vagina was thoroughly cleansed and packed with gauze and panhysterectomy performed.

The patient made a good recovery and at the present date is in good health and in active work.

The specimen consists of a uterus with its appendages removed by abdominal hysterectomy. From the anterior lip of the cervix springs a new growth, about the size of a hen's egg, extending almost as high as the internal os, while its lower margin projects into the vagina about as much below the external os as the top of the growth is above this point. This growth has not sprung from the endometrium from which it is separated by a narrow margin of apparently healthy uterine tissue. In parts the growth is of a dead white colour, though the major portion of it is stained a dark brown.

The pathological investigation of the tumour was kindly undertaken by Dr. Powell White, director of the laboratory for cancer research at the Manchester University, who has made the following report:—

"The greater part of the tumour is carcinomatous in structure, consisting of moderately large cells of epithelial type. Alveolar arrangement is marked in some places, but in others is not so evident. At one spot near a corner of the section is an area of large spindle-shaped cells. This area strongly suggests sarcoma. It is fairly well



Endothelioma of Cervix

marked off from the carcinomatous portion and is apparently in continuity with the uterine wall. In many places there are cells loaded with pigment. This pigment is, I think, hæmatoidin and is derived from extravasated blood, of which there is a good deal. I do not think it is melanin. The pigment does not give the iron reaction. The tumour is a very unusual one, and on the whole I am inclined to consider the carcinomatous portion as of endothelial origin. I think that the tumour cells are probably modified endothelial cells, and therefore that the tumour is an endothelioma. The tumour bears no resemblance to any ordinary form of carcinoma or sarcoma of the cervix. The irregularity in structure and the marked phagocytic properties of the cells suggest their relation to endothelium."

Endothelioma of the Vulva.

By D. Gray Newton, M.B., C.M., (Ed.), F.R.C.S. (Ed.),

Assistant Surgeon, Jessop Hospital for Women, Sheffield.

A number of cases of perithelioma and endothelioma of the uterus and ovaries have been recorded within the last few years, but I am unable to trace any record of an endothelioma of the vulva. I therefore feel that this case of mine is worth reporting.

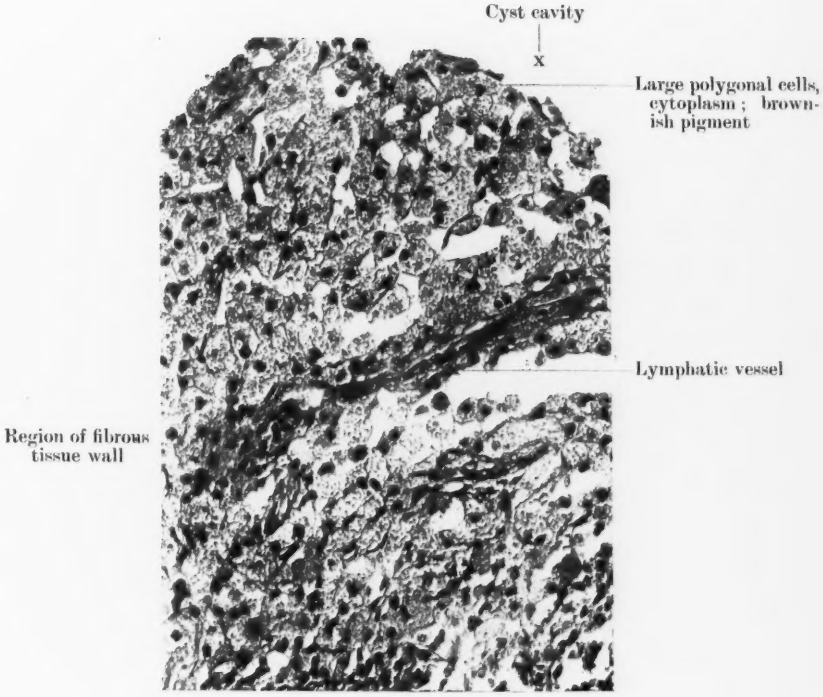
Mrs. S——, aged 32 years, first came to see me in June 1913. She complained of a large lump between her legs, which she had noticed for the first time three years before. It had grown very slowly till within the last six months, during which it had increased rapidly. For the last two months before I saw her, the patient began to feel pain about the swelling. This was, possibly, due to extravasation of blood into the growth.

Her menstrual and obstetrical history was normal. Her general health has never been good since the birth of her only child nine years ago. No gonorrhœal history could be obtained.

On examination, I found a large semi-solid pear-shaped swelling on the outer side of the right labium. It passed from within, upwards and outwards, and was such a size that it displaced the right labium over the middle line, thus obscuring the ostium vaginæ. On palpation the swelling felt tense, but painless; it could be moved from side to side, and could be raised, thus enabling me to introduce my fingers under it. I was also able to reach the upper pole of the tumour. These points helped me in the differential diagnosis and put aside two of the commoner causes of swelling in this region, namely, cyst of the round ligament, and hernia into the labia majora. Bartholin cysts have also to be considered in the diagnosis of labial swellings. These are usually small and almost invariably associated with gonorrhœa, and, according to Veit, if the cysts are large they are most commonly connected with Gärtner's duct. As to the nature of the swelling a provisional diagnosis was made of a fibroma or fibrolipoma. Eventually I removed the tumour, and the patient made an uneventful recovery.

The specimen was sent for a pathological report, which is as follows:—

The tumour is roughly pear-shaped, and after hardening measures 6 by 4 inches. The broad lower portion is covered with pigmented skin, and the rest with loose connective-tissue and fat. On section a unilocular cavity is disclosed containing 500 cc. of a thick, greenish-



Photomicrograph of a section showing the endothelial character of the cells.

× 250.

brown fluid. The wall is firm and fibrous, and the inner surface bears some well-marked ridges which may be the remains of septa across the tumour.

The fluid contains some mucous, leucocytes, endothelial cells, altered blood and granular debris.

Microscopic Examination.

The walls are chiefly composed of fibrous tissue with a number of thin-walled blood-vessels. In places there are some muscular bundles, probably part of the superficial muscles of the perinæum. The fibrous tissue becomes looser towards the cavity of the cyst, and between the bundles of fibrous tissue there are columns of large poligonal cells with sharply-defined cell margins. The cytoplasm is abundant and contains a brownish pigment, no doubt absorbed from the fluid contents of the cyst. The nucleus is small in comparison to the size of the cell and has a nucleolus. The lining of the cavity is formed of an irregular sheet of these closely-packed cells with only a very scanty framework of fibrous tissue. There is no sharp line of demarcation between these lining cells and the fibrous tissue wall; they seem to gradually merge one into the other. There are a few blood-vessels and numerous lymphatics from whose inner walls these cells appear to be growing. The cells show no sign of flattening such as is found in simple cystic dilatations.

The histological characters and the apparent origin from the lymphatics suggests that they are endothelial cells; and they are clearly proliferating. The tumour is, therefore, a benign endothelioma which has undergone cystic degeneration in the centre.

I wish here to thank Mr. W. W. King for his help in the preparation of the sections.

Concealed Accidental Hæmorrhage Accompanied by Intraperitoneal Hæmorrhage.

By Harold Clifford, M.B., F.R.C.S.E.

Honorary Gynæcologist to the Salford Royal Hospital; and Assistant Surgeon for Women to the St. Mary's Hospitals, Manchester.

This case appeared to me to be of sufficient interest to bring before the Society, as, as far as I am aware, the occurrence of internal hæmorrhage as a complication of concealed accidental hæmorrhage has not been frequently reported. I am indebted to Dr. Dougal for the notes of the case taken at the time.

The patient, a woman of 25, who had had one full-term normal labour previously, was admitted to the Maternity Department of St. Mary's Hospital on September 6th, 1913. On admission she was very pallid in appearance, had a poor pulse of 120 and a subnormal temperature. There was a very slight discharge of blood from the vagina; the urine was solid with albumin and she had reached full-term. The uterus was very tense and tender, and there was general abdominal pain, though no actual labour pains. The cervix admitted two fingers, and the membranes were unruptured though they ruptured very shortly, and there was a gush of liquor amnii and dark blood. The patient's condition did not improve, so it was decided to perform Cæsarian section and to remove the uterus. The abdomen contained a large quantity of free blood which evidently came from some ruptured veins in the right broad ligament apparently due to the great distension of the uterus. The uterus contained a large quantity of blood; the placenta was completely separated and there were large clots between it and the uterine wall. The child was stillborn. After emptying the uterus supravaginal hysterectomy was performed and the abdomen closed, the whole operation occupying twenty-two minutes.

The general condition of the patient improved somewhat for a time, but then gradually became worse, and in spite of intravenous injections of saline and the administration of pituitary extract, camphor, etc., the patient died six hours after the operation.

REPORTS OF SOCIETIES.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held in Manchester, Friday, December 19, 1913.

The President, Dr. W. E. Fothergill (Manchester), in the Chair.

Present : 21 members.

Dr. Donald (Manchester) showed a case of

Endothelioma of the Cervix Uteri,

the account of which appears in this number of the Journal.

Dr. Blair Bell (Liverpool) said he would like to know the reason why Dr. Powell White, in his pathological report of the specimen, had described it as a carcinoma and an endothelioma at one and the same time. He (Dr. Blair Bell) personally did not object to endotheliomata being called carcinomata any more than he considered the general expression 'carcinoma of the body of the uterus' to be wrong. If we adhered to the old nomenclature, based on the three-layer theory, strictly speaking carcinomata of the body of the uterus and even of the cervix were sarcomata since the uterus was developed in mesoderm. He thought, however, that before long this classification must be given up for reasons which could best be put forward in a discussion on the subject, for it was difficult to mention them in a few words.

Dr. Fletcher Shaw (Manchester) said he thought Dr. Powell White used the term carcinoma in a purely descriptive sense. Parts of the section looked very like glandular carcinoma, other parts like sarcoma, so that, at the first glance, the specimen seemed to be a tumour of mixed origin, carcinoma and sarcoma. Closer examination showed that these two parts ran into each other and that they both arose from endothelium, moreover the cells from some parts of the "sarcomatous" portion were much larger than the cells found in true sarcoma.

Dr. Blair Bell (Liverpool) showed

(1) An Unusual Malformation of the Uterus.

This specimen consisted of a small uterine horn together with the tube, ovary, ovarian ligament, and portion of the round ligament of the same side. The peculiar interest of the specimen lay in the fact that the uterus itself was perfectly formed in every respect, and that the small horn projected from the left cornu just as the normal tube does. The tube on the left side was a continuation of the small horn, and the round and ovarian ligaments were attached at the end of the horn where it merged into the tube.

This arrangement was, of course totally different from that usually found in the bicornute uterus which was formed by the imperfect fusion of the Müllerian ducts. In this case, the small horn must have resulted from the fact that on the left side the portion of the Müllerian duct marked off for the formation of the uterus by the round ligament must have been longer than the corresponding portion on the right side.

A fuller account of the malformation will be published subsequently.

(2) Specimen of Ampullary Tubal Pregnancy on the Point of Rupture.

The interest of this case lay in the fact that whereas ampullary tubal pregnancies practically always aborted, in this specimen the tube was on the point of *rupture*, and much bleeding had already occurred into the peritoneal cavity, while there was no attempt at abortion through the abdominal ostium of the tube. The specimen had been cut longitudinally across and showed the amniotic sac, containing a five week old fœtus, embedded in blood-clot.

Dr. Leith Murray and Dr. R. M. Littler (Liverpool) showed

A Case of "Mixed Tumour" of the Uterus (Adeno-Chondro-Sarcoma),

the full account of which appears in this number of the Journal.

Dr. Clifford (Manchester) showed a case of

Concealed Accidental Hæmorrhage accompanied by Intra-peritoneal Hæmorrhage,

the account of which appears in this number of the Journal.

Mr. Miles H. Phillips (Sheffield) asked about the *immediate* after-treatment in this case. He thought that, in such cases of extreme shock, great harm results from immediately lowering the patient from the Trendelenburg position, and from taking her out of the hot theatre into an atmosphere which is almost certain to be at a lower temperature. In his own case he had kept the patient, who was almost lifeless, in the theatre for several hours, until she showed signs of recovery.

Dr. Willett (Liverpool), in an enquiry regarding (*a*) the health of the patient during pregnancy, and (*b*) the pathological changes if any, in the uterine musculature, said he had observed that in accidental hæmorrhage a history of previous ill-health could frequently be elicited. He thought it was to be borne in mind that the shock of a radical procedure might turn the scale against the patient; at the same time he agreed that in cases such as the one recorded it was to be considered.

Dr. Fletcher Shaw (Manchester) said an interesting point had been raised as to the pathology of this condition. He had examined several uteri removed for accidental hæmorrhage but had not been able to detect any degenerative changes. The marked feature in all these uteri was the large amount of elastic tissue around the blood-vessels, such as is found in all chronic metritic uteri; this accumulation of elastic tissue is due to subinvolution at some previous pregnancy, not to any change during the present pregnancy. Very many patients with accidental hæmorrhage also had albuminuria and a bad general condition, to which cause the majority of these cases must be attributed, though the condition of "chronic metritis" might be a contributing factor.

Dr. LEITH MURRAY (Liverpool) urged the importance of a minute examination of the blood-vessels in the uterine wall in cases of accidental hæmorrhage. In view of Couvelaire's demonstration of interstitial hæmorrhage, extending even to the subserous layers, any investigation directed solely to a detection of degenerative changes in the musculature might yield only negative results.

Dr. DOUGAL (Manchester) showed

A FATAL CASE OF PUERPERAL INFECTION WITH THE BACILLUS ÆROGENES CAPSULATUS,

the description of which appears in this number of the JOURNAL.

Dr. LEITH MURRAY (Liverpool) recalled an acute case very similar to that related by Dr. Dougal. Infection occurred after an early abortion and the illness lasted twenty-four hours. Fifteen hours after the onset the patient, from head to foot, was the colour of a rich mahogany; she was quite conscious, till shortly before death, in spite of this universal laking of the blood; bullæ were noted on the chest and abdomen before death; the characteristic bacillus was recovered from a specimen of the urine taken during life. He commented on the ubiquity of the organism in the bowel, perineum, and peritoneal exudates, and on the rarity with which it developed characteristics other than those of an anærobic saprophyte. Probably in all cases where infection developed, the first nidus was in dead material such as blood-clot or a dead fœtus; thereafter the diffused poisons so demoralised the tissues that an acclimatisation of the bacillus was possible.

Dr. FLETCHER SHAW (Manchester) said these cases were very interesting and very rare. One such case occurred while he was a resident at St. Mary's and he believed one other case occurred between his and Dr. Dougal's case, so that in ten years, during which about 45,000 deliveries had taken place, three cases of this infection had occurred. His case died on the fifth day with a temperature of 105°, and at the autopsy, twelve hours later, the body was very much discoloured and swollen and gas occurred in the subcutaneous tissues. The uterus was riddled with holes as in Dr. Dougal's case, the peritoneum was stripped off the wall of the uterus to form gas containing bullæ, the broad ligaments were much swollen and the gas had tracked up under the posterior layer of peritoneum as far as the liver forming large bullæ, but none were found within the folds of the mesentery. There were numerous small holes in the liver and kidney but not so marked as in Dr. Dougal's case.

Mr. MILES H. PHILLIPS (Sheffield) referred to a somewhat similar case which he had seen recently. Death occurred within twenty-four hours of delivery of a slightly macerated six monfhs' fœtus. The uterus also contained a large myoma in an advanced stage of necrobiosis. The patient was admitted to hospital with acute abdominal pain and a very quick and small pulse. There was also blood in the urine. The doctor had experienced great difficulty in manually removing the placenta. The patient's temperature was 104° F. Traumatic rupture of the uterus containing a necrotic fibroid was diagnosed and abdominal section was contemplated, but her condition did not warrant it and death occurred three hours later. Post mortem examination showed the changes characteristic of infection by the bacillus ærogenes capsulatus; there was no rupture of the uterus.

Dr. Blair Bell (Liverpool) read a paper upon

The Cause of the Non-coagulability of Menstrual Fluid and of Pathological Clotting.

In this paper Dr. Blair Bell first discussed the older views as to the causes of the non-coagulability of menstrual blood, and he pointed out how very easy it was to prove that it was not due to the acidity of the vaginal secretion, nor to the mucus mixed with the menstrual discharge. Experiments were first described by which these two views had easily been disproved. He then described experiments which were carried out in order to show that fibrin ferment was absent normally from menstrual blood. Further, many experiments, which were described, were carried out in an endeavour to find out how the fibrin ferment was removed from the menstrual blood. The results of these experiments were negative, but evidence was obtained which seemed to point to the conclusion that the vital processes of the normal endometrium destroyed or in some way abstracted the fibrin ferment from the blood passing through it.

Tables were given of over fifty cases in which menstrual discharge had been examined. In about half fibrin ferment was present and in about half it was absent. Nearly all the cases had gynæcological lesions, and it appeared that a lesion of the endometrium was necessary for the presence of fibrin ferment in the menstrual discharge. The paper will be published in full elsewhere.*

* *Journal of Pathol. and Bacteriol.*, April 1914.